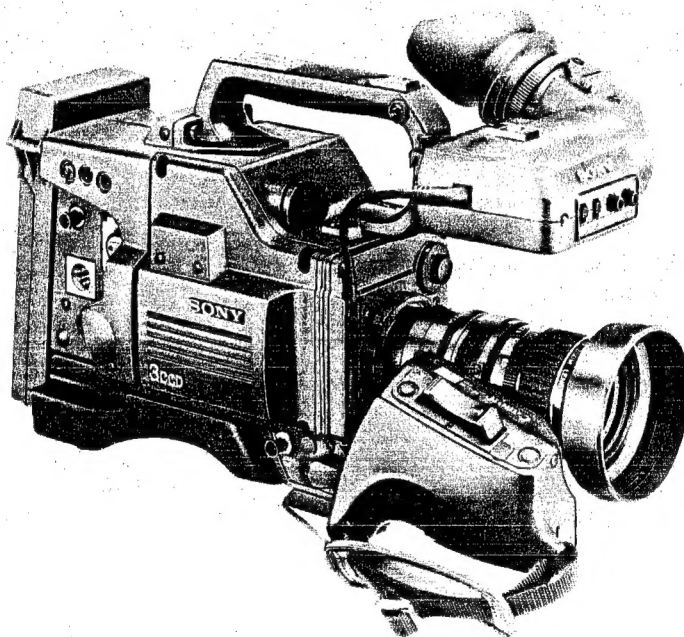


COLOR VIDEO CAMERA
CAMERA ADAPTOR
1.5INCH ELECTRONIC VIEWFINDER
ZOOM LENS

DXC-325P
CA-325P
DXF-325CE
VCL-810BX

VOL. 1
GENERAL DESCRIPTION
SERVICE INFORMATION
ALIGNMENT

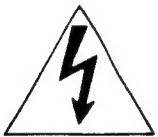
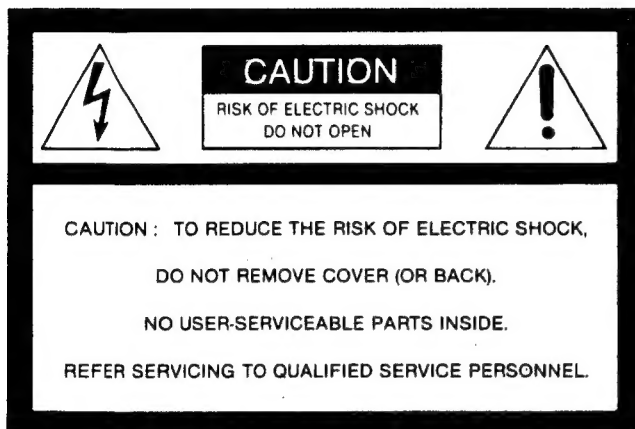


SONY®
SERVICE MANUAL

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

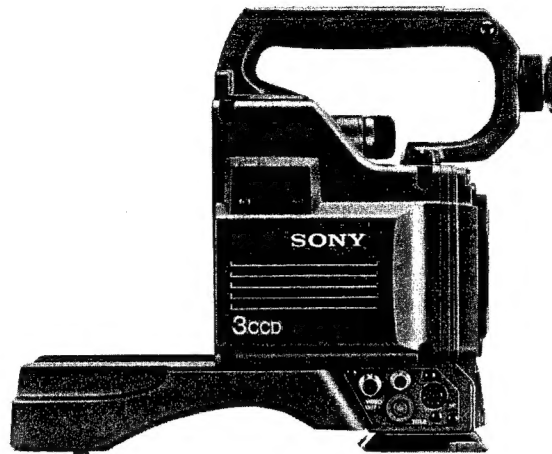


This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Warning—This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a computing device pursuant to Subpart J of Part 15 of FCC Rules.

COLOR VIDEO CAMERA



SPECIFICATIONS

Camera head (DXC-325/325P) and camera adaptor (CA-325/325P)		Sync system	Internal External with the BS or VBS signal supplied to the GEN LOCK input connector or the reference signal input to the VTR/CCU/CMA connector from the GEN LOCK connector of the CCU-M3/M3P
Image device	Interline-transfer CCD, 3-chip	Horizontal resolution	530 lines (center)
Picture elements	510 × 492 (h/v) (NTSC) 500 × 582 (h/v) (PAL)	Minimum illumination	20 lux with F1.4, + 18 dB (NTSC) 20 lux with F1.4, + 18 dB (PAL)
Sensing area	6.4 mm × 4.8 mm (equivalent to a 1/2-inch pickup tube)	Sensitivity	2000 lux with F5.0, at 3200 K (NTSC) 2000 lux with F5.0, at 3200 K (PAL)
Built-in filters	1: 3200 K 2: 5600 K + 1/8 ND 3: 5600 K	Gain selection	0 dB, 9 dB or 18 dB, selectable
Lens mount	Bayonet mount	Video output	Composite signal: 1.0 V(p-p), sync negative, 75Ω unbalanced Y/C separate signal: Y: 1.0 V(p-p), sync negative, 75Ω unbalanced C: burst level 0.286 V (NTSC) 0.3 V (PAL) 75Ω without sync
Signal system	EIA standards, NTSC color system (for DXC 325) CCIR standards, PAL color system (for DXC 325P)	Signal to noise ratio	58 dB (NTSC) 56 dB (PAL)
Scanning system	525 lines, 2:1 interlace, 30 frames/sec. (NTSC) 625 lines, 2:1 interlace, 25 frames/sec. (PAL)	Registration	0.05 % for Zone I 0.05 % for Zone II 0.05 % for Zone III
Scanning frequency	Horizontal: 15.734 kHz (NTSC) 15.625 kHz (PAL) Vertical: 59.94 Hz (NTSC) 50.00 Hz (PAL)		

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SERVICE MANUAL

Inputs/Outputs VTR/CCU/CMA connector: Sony Q-type, 14-pin
 DC IN: XLR-type, 4-pin
 MIC IN: XLR-type, 3-pin
 GEN LOCK: BNC-type
 VIDEO OUT: BNC-type
 LENS: 1/2-inch lens connector (7-pin)
 2/3-inch lens connector (6-pin)
 VF: 8-pin
 EAR: mini jack
 INTERCOM: mini intercom
 TITLE: 8-pin

Power requirements
 12 V DC

Power consumption
 8 W (without viewfinder)

Operating temperature
 -5°C to +45°C (23°F to 113°F)

Storage temperature
 -20°C to +60°C (-4°F to 140°F)

Weight
 3 kg (4 lb 7 oz)

Dimensions
 See the illustrations below.
 Unit: mm (inches)

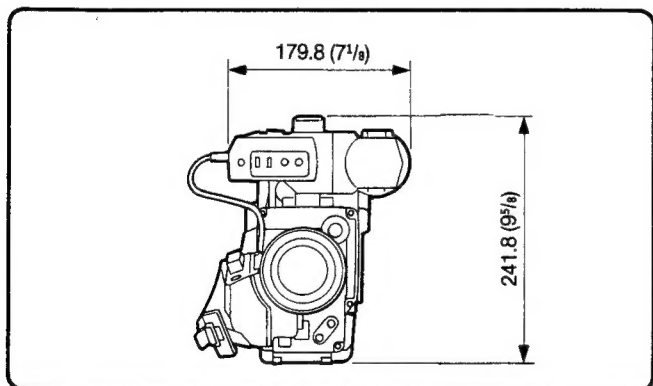
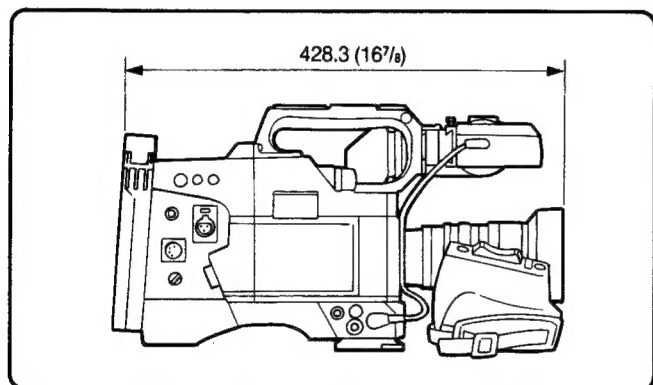
Carrying case (LC-325)

Weight Approx. 4.4 kg (9 lb 8 oz)
 Dimensions Approx. 608 × 260 × 386 mm (w/h/d)
 (24 × 10¹/₄ × 15¹/₄ inches)

Accessories supplied

CCQ-2BRS camera cable (with Q-type 14-pin connectors)
 (supplied with the DXC-325K/325PK/325L/325PL only) (1)
 CA-325/325P camera adaptor (supplied with the
 DXC-325K/325PK/325L/325PL only) (1)
 VCL-810BX zoom lens (supplied with the DXC-325K/325PK
 only) (1)
 DXF-325/325CE electronic viewfinder (supplied with the
 DXC-325K/325PK/325L/325PL only) (1)
 LC-325 carrying case (supplied with the DXC-325K/325PK/
 325L/325PL only) (1)
 Lens cap (1)
 Chart for flange focal length adjustment (1)

Design and specifications are subject to change without notice.



3-5. Video Process System (PR-111 Board)	3-13
3-5-1. G ch Video Level Adjustment	3-13
3-5-2. B ch Video Level and Pre-gain Adjustment	3-13
3-5-3. R ch Video Level and Pre-gain Adjustment	3-14
3-5-4. Black Set and Pedestal Adjustments ..	3-15
3-5-5. G ch Gamma Balance and Gamma Set Adjustment	3-16
3-5-6. R ch Gamma Balance Adjustment	3-17
3-5-7. B ch Gamma Balance Adjustment	3-18
3-5-8. R/B ch Gamma Set and Preset Adjustment	3-19
3-5-9. White Clip Adjustment	3-20
3-6. Image Enhancer System Adjustment	3-21
3-6-1. CCD BIAS Adjustment	3-21
3-6-2. 1H GAIN Adjustment	3-21
3-6-3. Crispening Adjustment	3-22
3-6-4. H. V. Ratio Adjustment	3-22
3-6-5. Detail Level Adjustment	3-23
3-7. Auto System (AT-53 Board)	3-24
3-7-1. Low Light Adjustment	3-24
3-7-2. ABL Adjustment	3-24
3-7-3. Auto Iris Adjustment	3-25
3-8. Resolution Adjustment (DR-68 Board)	3-26
3-9. Intercom System (CA-325/CA-13 Board) ..	3-27
3-9-1. Side Tone Adjustment	3-27

TABLE OF CONTENTS

1. GENERAL DESCRIPTION

Composition	1-1
Features and Notes on Use	1-2
Features	1-2
Precautions	1-3
Special Characteristics of a CCD	1-3
Location and Function of Controls	1-4
DXC-325/325P Camera Head	1-4
Accessory Attachment	1-8
Microphone Attachment	1-8
Tripod Attachment	1-9
Power Sources	1-10
Power from the DC IN Connector	1-10
Power from the Battery Pack	
Compartment	1-11
Power from the VTR/CCU/CMA	
Connector	1-12
Connections	1-14
Connection with an S-VHS Format	
Portable VTR	1-14
Connection with a Portable VTR	1-15
Connection with a Table-Top VTR	1-16
Connection with a CCU-M3/M3P Camera	
Control Unit	1-16
Function of the Connected VTR	1-17
Adjustments	1-18
Preparation	1-18
Video Monitor Adjustment	1-19
Filter Section	1-19
White Balance and Black Balance	
Adjustments	1-20
Operation	1-22
Preparation	1-22
Recording with a Portable VTR	1-22
Output Level Adjustment	1-24
Checking the Video Level	1-24
Use of the GEN LOCK Connector	1-25
Recording with a Table-Top VTR	1-26
Warning Indicators and Character Display	1-27
Warning Indicators on the Viewfinder	1-27
Warning Indications on the Character	
Display	1-27
Character Display on the Viewfinder	1-28
Studio Use	1-33
System Example	1-33

Hints for Better Shooting	1-34
Understanding Light Color	1-34
Basic Camerawork	1-35
Cutting	1-38
Lighting	1-39
Optional Accessories and Recommended	
Equipment	1-40
Packing (Carrying Case LC-325)	1-41

2. SERVICE INFORMATION

2-1. Board Layout	2-1
2-2. Removal of Cabinet	2-2
2-3. Replacement of Main Parts	2-3
2-3-1. Replacement of Front Unit	2-3
2-3-2. Replacement of TG-38, DR-68 and	
CN-242 Boards	2-4
2-3-3. Replacement of Lens Harness	2-6
2-4. Connectors and Cables	2-7
2-4-1. Connector Input/Output Signals	2-7
2-4-2. Connections	2-10
2-5. System Block Diagram	2-11

3. ALIGNMENT

3-1. Preparation	3-1
3-1-1. Equipment Required	3-1
3-1-2. Connections and Initial Setting	3-2
3-1-3. Initial Setting	3-3
3-2. Before Adjustment	3-4
3-2-1. Color Bar Signal	3-4
3-2-2. Sensitivity Measurement	3-5
3-2-3. Gamma and Gradation	
Measurement	3-6
3-2-4. Resolution Measurement	3-7
3-3. SYNC Signal System (ES-1 Board)	3-8
3-3-1. Sub Carrier Frequency Adjustment	3-8
3-4. Encoder System (PR-111, ES-1 Board)	3-8
3-4-1. BARS Level Adjustment	3-8
3-4-2. Carrier Balance Adjustment	3-9
3-4-3. Y and SYNC Level Adjustment	3-9
3-4-4. Color Vector Adjustment	3-10
3-4-5. Zebra Adjustment	3-10
3-4-6. Color Bar Size Adjustment	3-11
3-4-7. S-VHS VTR-Y Level Adjustment	3-12
3-4-8. S-VHS VTR-Chroma Level	
Adjustment	3-12

SECTION 1

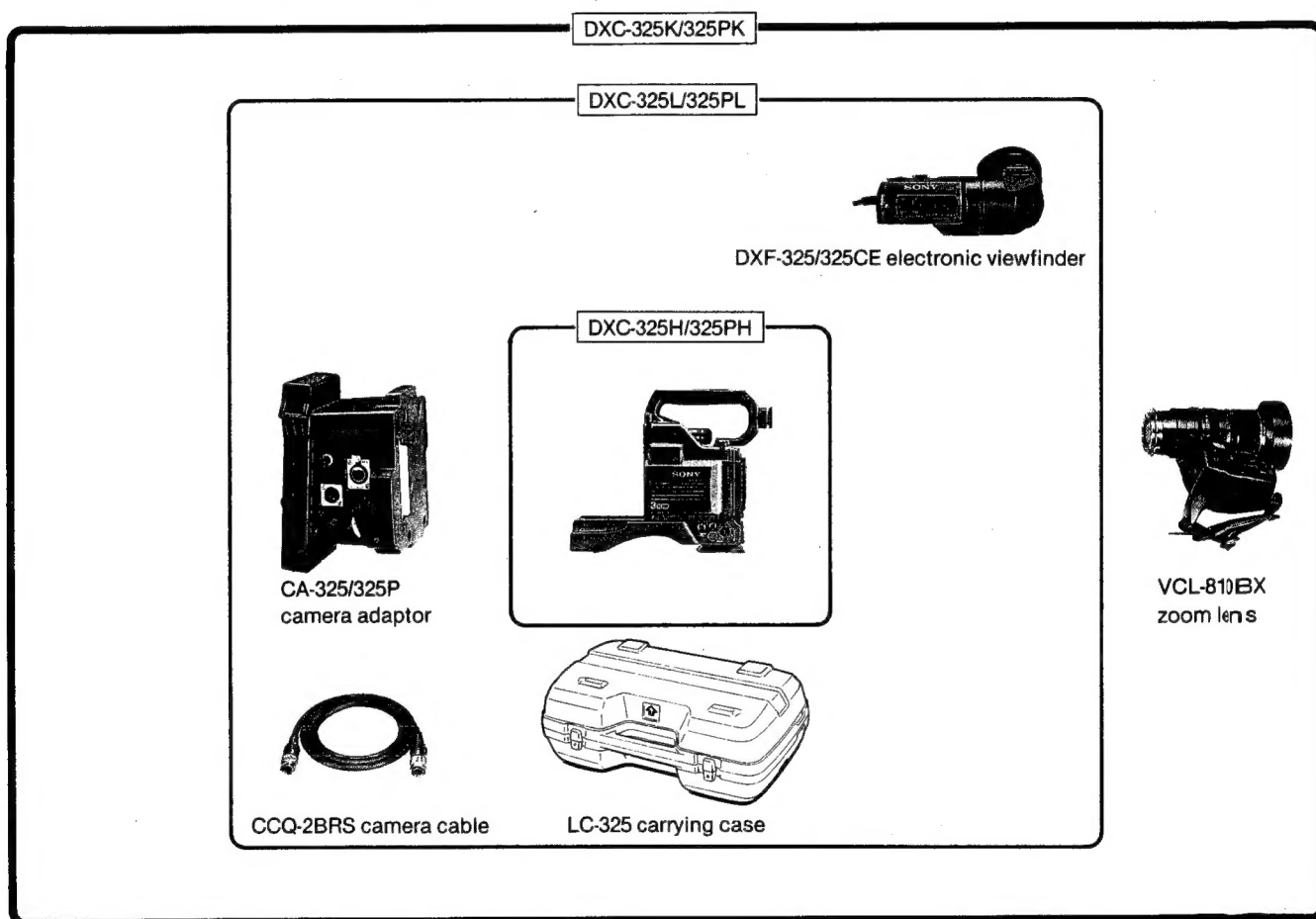
GENERAL DESCRIPTION

Composition

This instruction manual is for both the DXC-325 series (DXC-325K/325L/325H) and the DXC-325P series (DXC-325PK/325PL/325PH) color video cameras. These two types of cameras are designed for different signal systems, the NTSC and the PAL systems. So each type of camera must be used with the equipment which matches its signal system, but the operating procedures for both series are the same. The DXC-325 series is for the NTSC color system, and the DXC-325P series is for the PAL system.

The DXC-325K/325PK, the DXC-325L/325PL and the DXC-325H/325PH comprise slightly different components, as noted below. However, the operating procedure for the camera itself is the same.

If you use a zoom lens other than the VCL-810BX zoom lens, refer to the lens' instruction manual for information about its operation.



Composition	Model	DXC-325K/ 325PK	DXC-325L/ 325PL	DXC-325H/ 325PH
Camera head DXC-325/325P		Yes	Yes	Yes
Camera adaptor CA-325/ 325P		Yes	Yes	No
Zoom lens VCL-810BX		Yes	No	No
Viewfinder DXF-325/325CE		Yes	Yes	No
Carrying case LC-325		Yes	Yes	No
Camera cable CCQ-2BRS		Yes	Yes	No
Chart for flange focal length adjustment		Yes	Yes	Yes

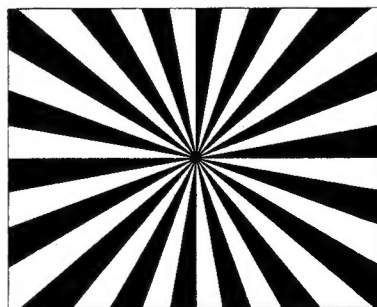


Chart for flange focal length adjustment

Features and Notes on Use

Features

The DXC-325/325P is a newly designed portable color video camera employing three 1/2-inch Charge Coupled Device (CCD) imagers each having a total of 250,000/290,000 (for the NTSC and PAL models respectively) effective picture elements. The DXC-325/325P is normally used with the CA-325/325P camera adaptor as a single camera unit, but, if necessary, it can be separated from the camera adaptor and can be used with a variety of different units which will be introduced in the market in the near future. The camera can be used for outdoor recording when used with a portable video cassette recorder, and can also be used as a studio camera when connected to a CCU-M3/M3P camera control unit.

Adoption of CCD

- Incorporation of a CCD results in a compact, lightweight camera body which consumes less power than does a camera using pickup tube(s).
- Low lag, high resistance to image burning and no deflection distortion.
- The CCD is not affected by vibration and mechanical shock.
- The CCD imager is not influenced by terrestrial magnetism.
- Thanks to the high signal-to-noise ratio, the video output level can be raised by 9 dB or 18 dB to obtain a clear picture under low light conditions.
- The electronic shutter is built into the imagers and enables the DXC-325/325P to produce clear images even when the objects it is shooting are moving at very high speeds. The advantages of this function are most obvious during playback of still or slow motion pictures.

Various connection capability

- The camera can be used as a studio camera when connected to a CCU-M3/M3P camera control unit.
- The camera can be connected to an S-VHS format VTR.
- If a special adaptor (will be introduced in the near future) is attached to the DXC-325/325P camera head, it can output an RGB format signal.

Power sources

- A compartment for the NP-1A battery pack is built into the camera adaptor. The camera and 1.5-inch viewfinder can be used for about 120 minutes with a fully charged NP-1A (optional).
- The power can be supplied to the camera from a portable VTR or from the CCU-M3/M3P camera control unit.
- A CMA-8/8CE camera adaptor (optional) is needed if the camera is to be used with the AC power source.

Automatic adjustment and memory functions

- The white balance and black balance are automatically adjusted by a microcomputer, and the adjusted values are retained for about 12 hours while the camera's power is off.
- The black level drift is automatically adjusted, together with the black balance.
- If the entire picture is too bright, the black level is lowered to the appropriate level by the automatic black level (ABL) adjustment so that a picture with good contrast can be obtained.

Display and related functions

- The character generator built into the camera displays title characters to be inserted on the viewfinder or monitor during recording.
- In addition to title characters, the operational status of the camera and the warning indications are also displayed on the viewfinder.
- The REC indicator on the viewfinder blinks if a VTR malfunctions.
- Zebra pattern appears on the viewfinder screen when the video output level is about 70 to 80 IRE (for NTSC model) or 490 to 560 mV (for PAL model). This pattern provides a useful reference when the operator manually adjusts the iris.

Cordless electrical connection to the VCL-810BX camera lens unit

- The DXC-325/325P is equipped with a pin-type lens connector which connects directly to the electrical circuitry of the lens unit. The lens can thus be controlled from the video camera without using a lens cable.

Location of controls to avoid misoperations

- The switches which are not used frequently are located behind the cover on the side panel so that you can forget about possible misoperations while you are using the video camera.

Newly designed camera body and lens grip

- The camera will be well balanced on your shoulder when holding it with the lens grip. In addition, you can see to your right over the camera body while you are shooting.

Precautions

Safety

- Do not try to mount a 2/3-inch lens directly on the DXC-325/325P.
Be sure to attach an LO-32BMT lens mount adaptor (optional) to your 2/3-inch lens if you want to mount it.
- Operate the camera only on 12 V DC. For operation from an AC power line, use the camera adaptor recommended for this camera.
- Allow adequate air circulation to prevent internal heat build-up.

Operation

- Avoid rough handling or mechanical shock.
- Do not operate the camera outside a -5°C to $+45^{\circ}\text{C}$ (23°F to 113°F) temperature range.
- Keep the camera in a horizontal plane.
- Keep the camera away from very strong magnetic fields to avoid distortion and flutter on the screen.
- Do not hold the camera by the viewfinder.
- Be sure to cover the lens with the supplied lens cap when the video camera will not be used for a long period of time.

Operation of the viewfinder

- Do not point the viewfinder directly at the sun, or the plastic inside the viewfinder may be damaged.
- The picture on the viewfinder screen may be distorted if it is used in strong magnetic fields.

Cleaning

Clean the cabinet, panel and controls with a dry soft cloth, or soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzene, which might damage the finish.

Repacking

Do not discard the carton. It affords maximum protection whenever the camera is transported. Do not transport or ship the camera only in the carrying case. Repack it as it was originally packed at the factory.

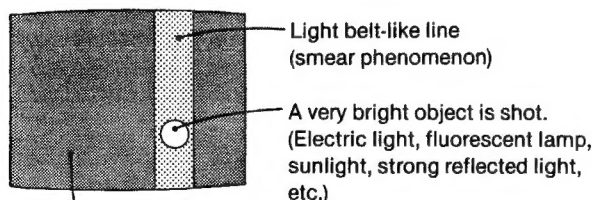
If you have any questions about this camera, contact your authorized Sony dealer.

Special Characteristics of a CCD

The following phenomena may appear on the monitor screen while the DXC-325 series color camera is used. These phenomena are not indicative of a camera malfunction.

Smear phenomenon

This may appear when a very bright object is shot.



Video monitor screen

White dots

White dots may appear in the video output if the camera is used under very high temperatures.

Wavy pictures

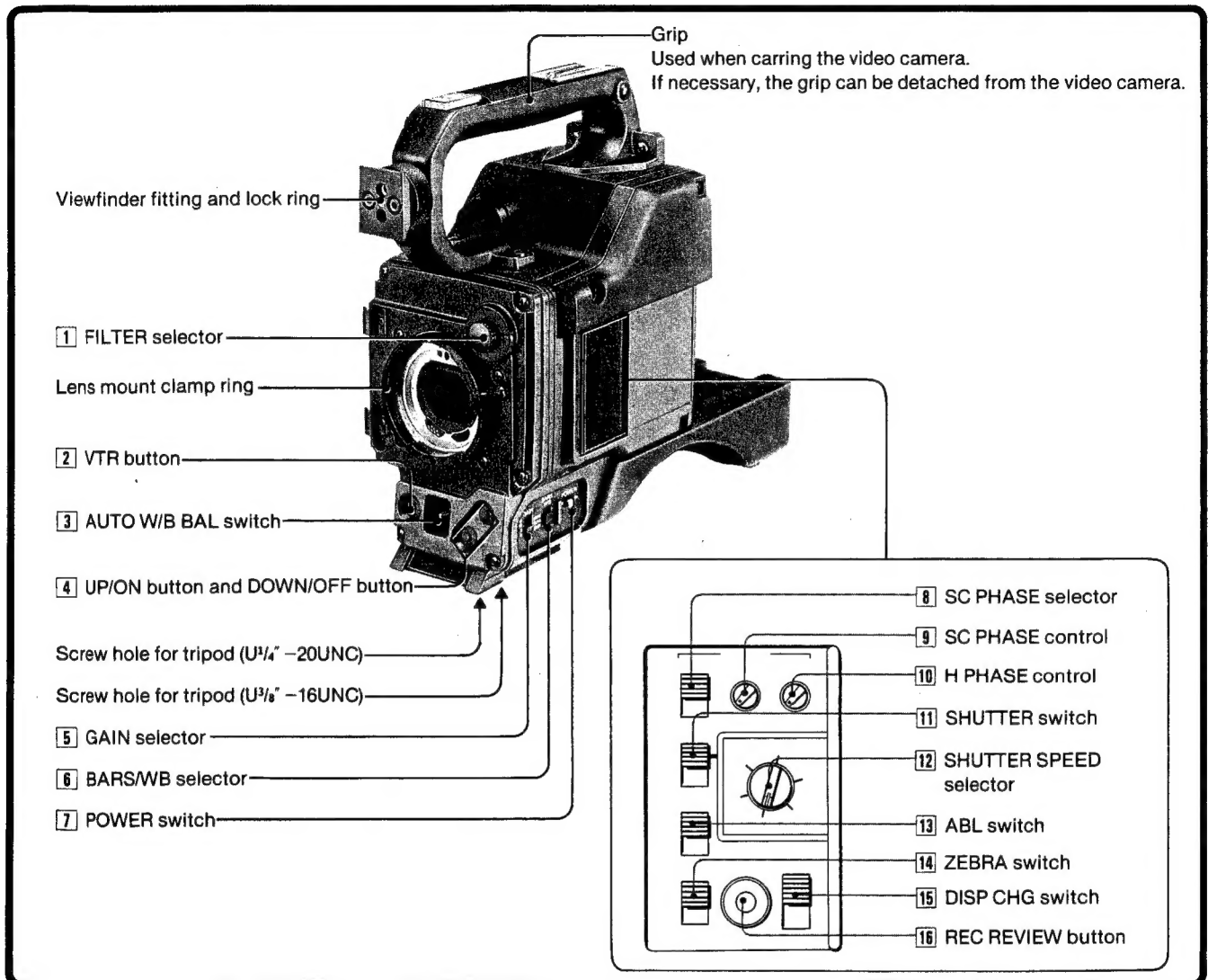
This may appear when fine stripes, straight lines, etc., are shot. Their images monitored on the screen look wavy.

Note on the electronic shutter

If the GAIN selector is set to the 18 (dB) position when the electronic shutter is used, a clear picture may not be obtained. Use the electronic shutter under the lighting conditions under which a clear picture is obtained with the GAIN selector set to the 0 or 9 (dB) position.

Location and Function of Controls

DXC-325/325P Camera Head



1 FILTER selector

Select the appropriate filter as indicated below.

Filter number	Color temperature	Lighting conditions
1	3200K	Iodine lamp, sunrise or sunset
2	5600K + 1/8 ND*	Bright outdoor
3	5600K	Cloudy or rainy

* ND: Neutral density filter

2 VTR button

When the camera is connected to a portable VTR, press this button to start recording. To stop recording, press the button again. If the camera is connected to a CCU-M3/M3P camera control unit, the return video pictures can be monitored on the viewfinder screen while the button is kept depressed. When the button is released, the camera pictures can be monitored.

3 AUTO W/B BAL (automatic white/black balance adjustment) switch

When the BARS/WB selector [6] is set to AUTO, white balance and black balance can be automatically adjusted with this switch. Black balance can also be adjusted automatically with this switch when the BARS/WB selector is set to 3200K.

WHT: For automatic white balance adjustment, push this switch to WHT. The adjusted value will be automatically stored in the memory.

BLK: For automatic black balance and black set level adjustment, push this switch to BLK. The adjusted value will be automatically stored in the memory.

This switch automatically returns to the center position when it is released.

4 UP/ON button and DOWN/OFF button

These buttons are used with the DISP CHG [15] switch (1) to set and position the title characters, (2) to switch the "LOW LIGHT" indication on or off, (3) to raise or lower the reference level of the automatic iris adjustment, or (4) to raise or lower the master pedestal level. For details, refer to "Warning Indicators and Character Display" on page 1-27.

5 GAIN selector

Normally set this selector to "0". When the selector is set to "9" or "18", the video output level is raised by 9 dB or 18 dB respectively.

6 BARS/WB (color bar generation/white balance adjustment) selector

BARS: When the selector is set to this position, a color bar signal is generated, supplied to the viewfinder and output from the VIDEO OUT and the VTR/CCU/CMA connectors on the CA-325/325P. Use this position for adjusting the video monitor. At this position, the iris of the zoom lens attached to the camera will be automatically closed.

AUTO: Generally set the selector to this position. When the AUTO W/B BAL switch [3] is set to WHT or BLK, the white balance or black balance will be automatically adjusted (and stored in the memory). After the adjustment, the memorized white balance and black balance values are always obtained at this position.

3200K: At this position the white balance is set to the factory preset value of an iodine lamp (3200K). When the selector is set to this position, set the FILTER selector [1] to an appropriate position. Use this position when there is no time to adjust the white balance. When the BARS/WB selector is set to this position, the automatic white balance adjustment of the AUTO W/B BAL switch [3] will not operate. (However, the automatic black balance adjustment of the AUTO W/B BAL switch [3] operates.)

7 POWER switch

ON: To turn on the camera
OFF: To turn off the camera

8 SC (subcarrier) PHASE selector

When two or more cameras are used simultaneously, select the SC phase difference between the gen-lock input and video output signals so that it is roughly adjusted to 0° or 180°. (See page 1-25.)

9 SC (subcarrier) PHASE control

When two or more cameras are used, this control is used for fine adjustment of the SC phase after the rough adjustment performed by the SC PHASE selector [8]. (See page 1-25.)

10 H (horizontal) PHASE control

When two or more cameras are used, turn this control with a small screwdriver to adjust the H phase difference between the gen-lock input and video output signals. (See page 1-25.)

Notes

- It is not necessary to use this control when only one camera is used.
- When a camera control unit is connected, adjust the H phase difference with the H PHASE control of the camera control unit.

11 SHUTTER switch

ON: The SHUTTER SPEED selector [12] is activated.

OFF: Normally, set at this position. This deactivates the SHUTTER SPEED selector [12].

12 SHUTTER SPEED selector

Used to switch the shutter speed.

The following six shutter speeds can be selected on this camera head.

DXC-325: 1/60, 1/100, 1/250, 1/500, 1/1000, 1/2000 sec.

DXC-325P: 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000 sec.

13 ABL (automatic black level) switch

When the entire picture is too bright, such as during outdoor shooting, set this switch to ON. The black level will be reduced to the appropriate level, and a well-contrasted picture will be obtained. Normally set the switch to OFF.

14 ZEBRA switch

This switch is used for manual iris adjustment. When the switch is set to ON, a zebra pattern appears as a reference on the part of the viewfinder screen where the video level of the object is 70 to 80 IRE (for NTSC) or 490 to 560 mV (for PAL). If the zebra pattern is not necessary, set this switch to OFF. (See page 1-24.)

15 DISP CHG (display change) switch

Each time this switch is pressed, the character display on the viewfinder screen changes in the following order: (1) alarm indication, (2) "LOW LIGHT" indication on/off, black balance, white balance, and gain settings, (3) initial indication of title setting and display of set title characters, (4) reference level setting for automatic iris adjustment, and (5) master pedestal level setting. For details, refer to "Warning Indicators and Character Display" on page 1-27.

Note

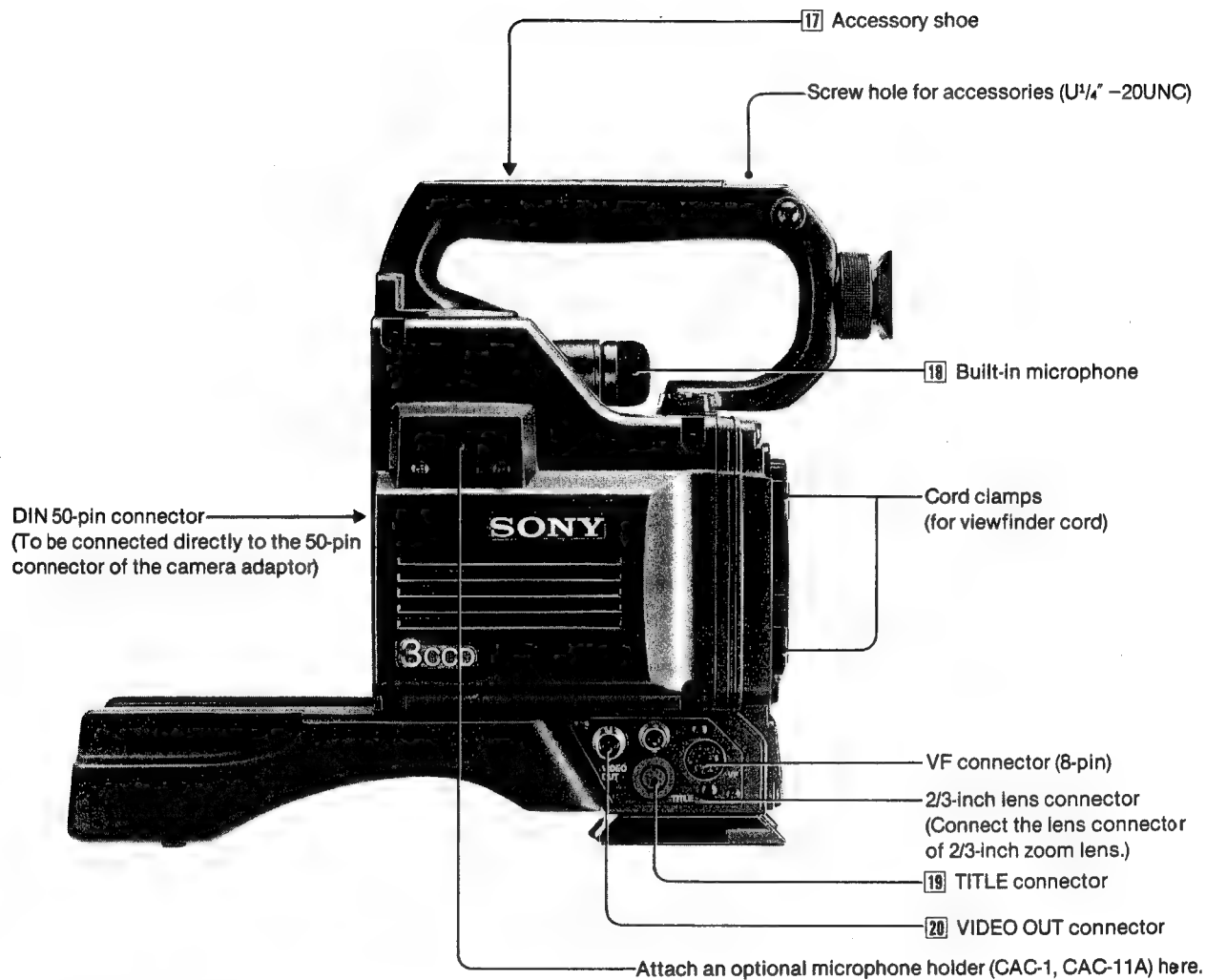
In the character display modes (3) to (5), the automatic white balance and black balance adjustment systems do not function.

16 REC REVIEW button

Not used.

Location and Function of Controls

DXC-325/325P Camera Head



17 Accessory shoe

An optional DXF-40A/40ACE or DXF-50/50CE viewfinder can be attached here. For viewfinder attachment, refer to the viewfinder's instruction manual.

18 Built-in microphone

When the camera cable is connected to a portable VTR, the built-in microphone is automatically connected, so a sound recording can be made simultaneously with the video recording.

When an external microphone is connected to the MIC IN connector on the CA-325/325P, the built-in microphone does not function.

19 TITLE connector (8-pin)

A TGR-325 title generator (optional) is to be connected to this connector.

20 VIDEO OUT (output) connector (BNC connector)

Connect to the video input of the VTR or video monitor. Title characters displayed on the viewfinder screen are also output from this connector.

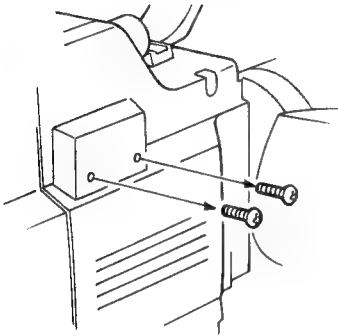
Accessory Attachment

Microphone Attachment

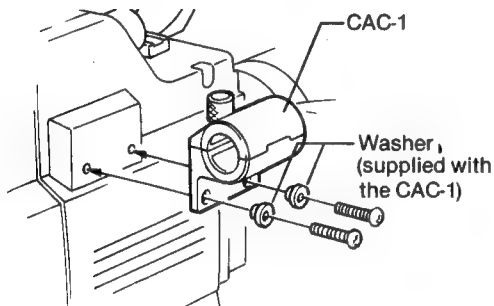
In order to use an ECM-672 external microphone (optional), first attach a CAC-1 or CAC-11A microphone holder (optional) to the camera head.

The CAC-11A microphone holder can also be attached in the same manner.

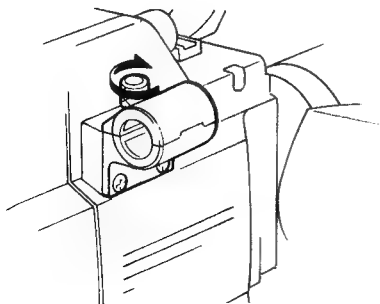
- 1** Remove the two screws from the side of the camera head.



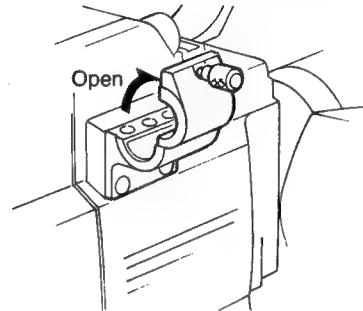
- 2** Attach the CAC-1 using the screws supplied with the DXC-325/325P.



- 3** Loosen the screw of the microphone holder.



- 4** Open the microphone holder.

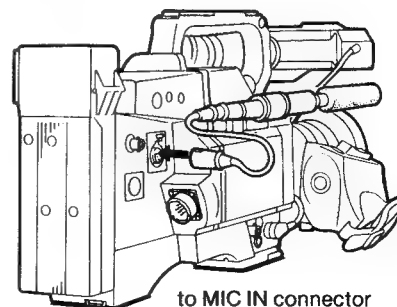


- 5** Attach a microphone adaptor to the microphone when a thin microphone is used.



When the ECM-672 is used, the microphone adaptor is not necessary.

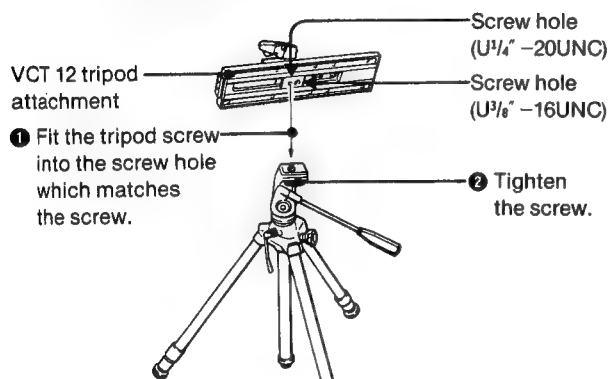
- 6** Insert the microphone to the microphone holder, and tighten the screw.



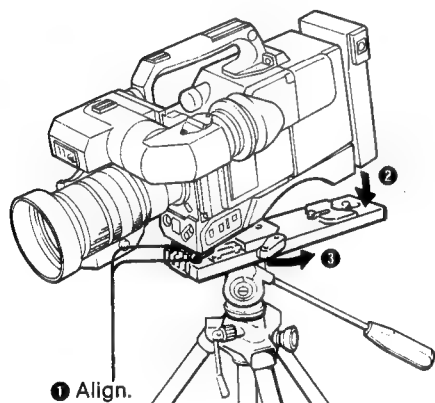
Tripod Attachment

Although the camera can be mounted on a tripod directly, use a VCT-12 tripod attachment (optional) when mounting with a large viewfinder.

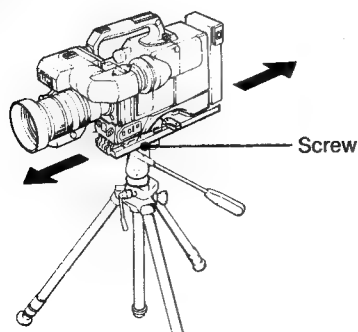
1 Attach the tripod attachment to the tripod.



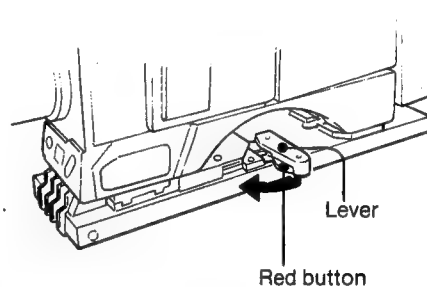
2 Attach the camera.



3 Slightly loosen the tripod screw, and move the camera to be balanced. Tighten the screw.



Camera detachment



While depressing the red button, slide the lever to the left to release the lock. Remove the camera.

Power Sources

Note on priority of power sources

The DXC-325/325P operates on any of the following three types of power sources:

- (1) Power from the DC IN connector
- (2) Power from the battery pack compartment
- (3) Power from the VTR/CCU/CMA connector
 - Power from the VTR when connecting a portable VTR
 - Power from the CCU when connecting a CCU-M3/M3P camera control unit
 - Power from the camera adaptor when connecting a CMA-8/8CE camera adaptor

When two or three of the power sources (1) to (3) are simultaneously connected to the camera, only one of them is used according to numerical order priority, and the other power source(s) is (are) automatically cut off.

Power from the DC IN Connector

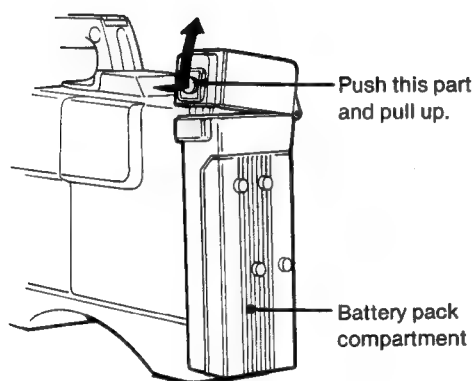
This connector is equipped for supplying power from an external DC power supply (12V DC).

Power from the Battery Pack Compartment (An NP-1A Battery Pack)

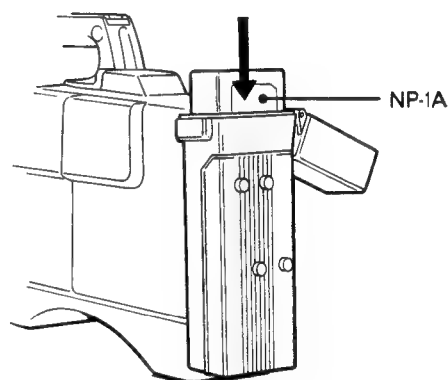
Use a fully charged NP-1A battery pack (optional) by inserting it into the battery pack compartment.

Installing an NP-1A battery pack

1 Pull up the lid of the battery case.



2 Install the battery pack, and close the lid.



Battery life

Continuous operation time

When using one fully charged NP-1A: About 120 minutes

Battery life warning

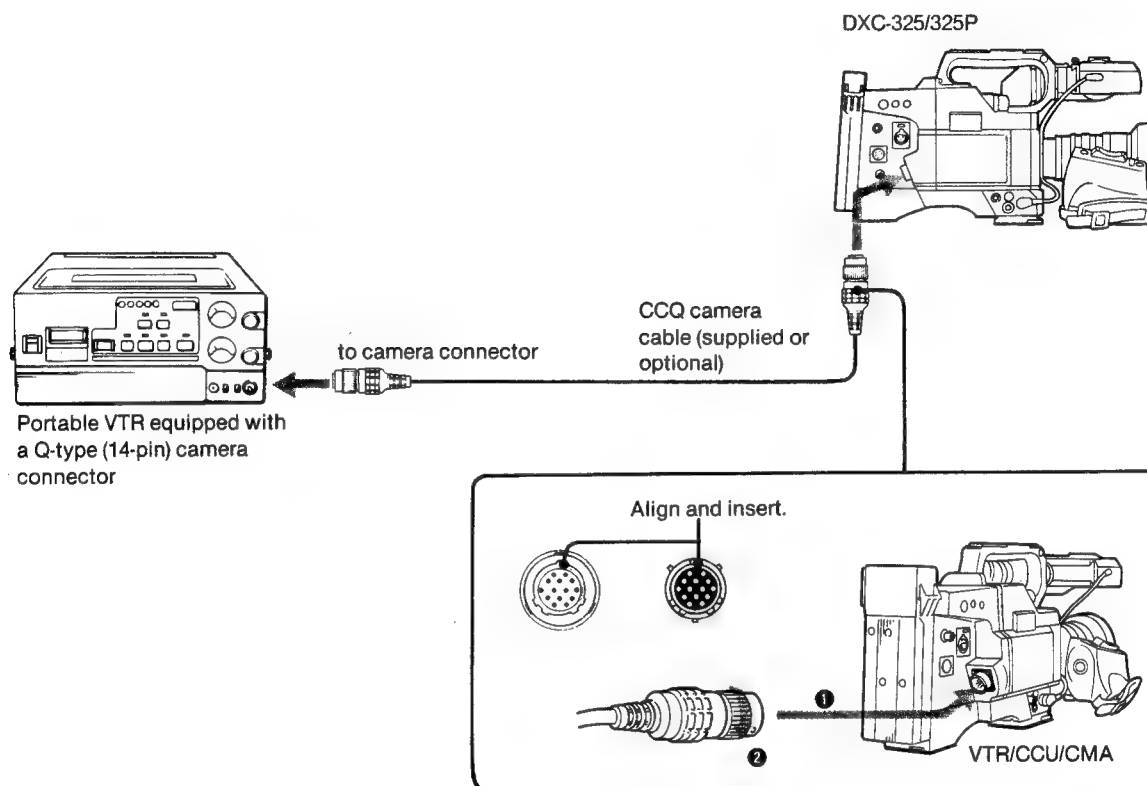
When the battery is nearly exhausted, the warning "BATT: EMPTY?" appears on the viewfinder screen. If you continue to use the battery after the "BATT: EMPTY?" warning has appeared, the BATT indicator of the viewfinder also lights up to indicate that the battery must be replaced immediately.

Battery charging

Recharge the NP-1A battery pack before each use, using the BC-1WA battery charger. It takes about 60 minutes at the normal temperature. For details on recharging, refer to the battery charger's instruction manual.

Power from the VTR/CCU/CMA Connector

Power from a portable VTR



Notes

- When the portable VTR is operated from rechargeable battery packs, the continuous operating time of the camera and portable VTR is about 80 minutes at normal temperatures (when the VO-6800/6800PS portable videocassette recorder and two NP-1A battery packs are used). The life of the batteries installed in the portable VTR is indicated by the BATT indicator of the viewfinder. (see page 43.)
- Refer to the VTR's instruction manual for information on the power supply to the VTR.

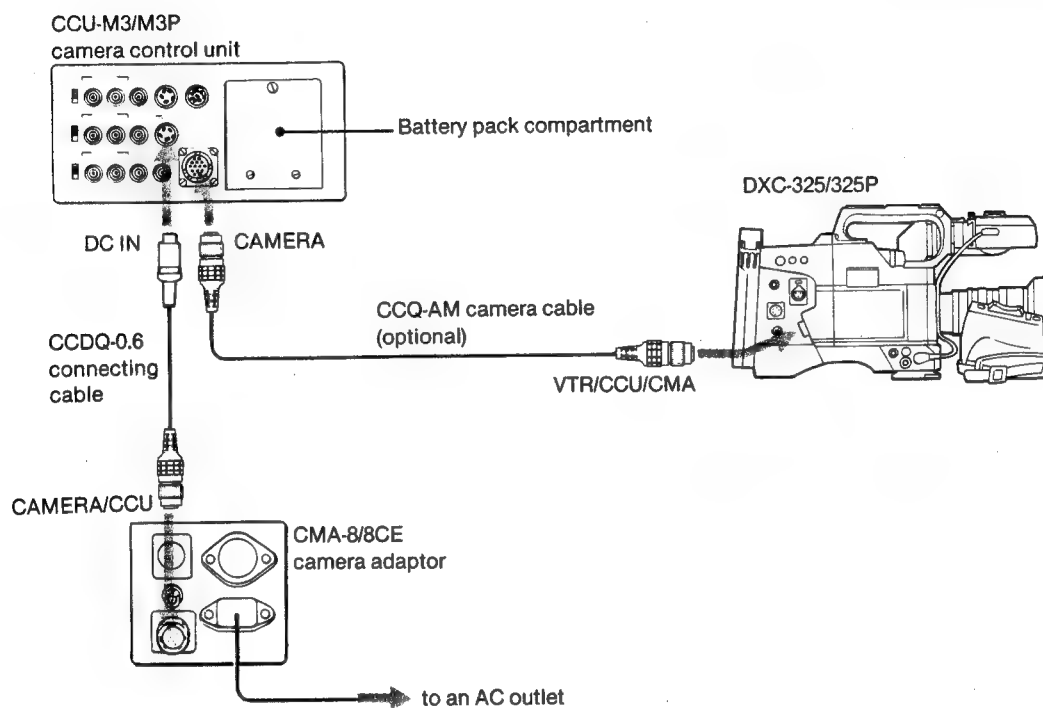
Caution

- Before operating the camera, make sure that the power supplied from the VTR to the camera is sufficient. If the power supply capacity of the VTR is not sufficient, the camera must be powered independently.
- When a portable VTR equipped with a K-type (14-pin) camera connector is used, the camera must be powered independently, because power is not supplied through the CCQK cable.

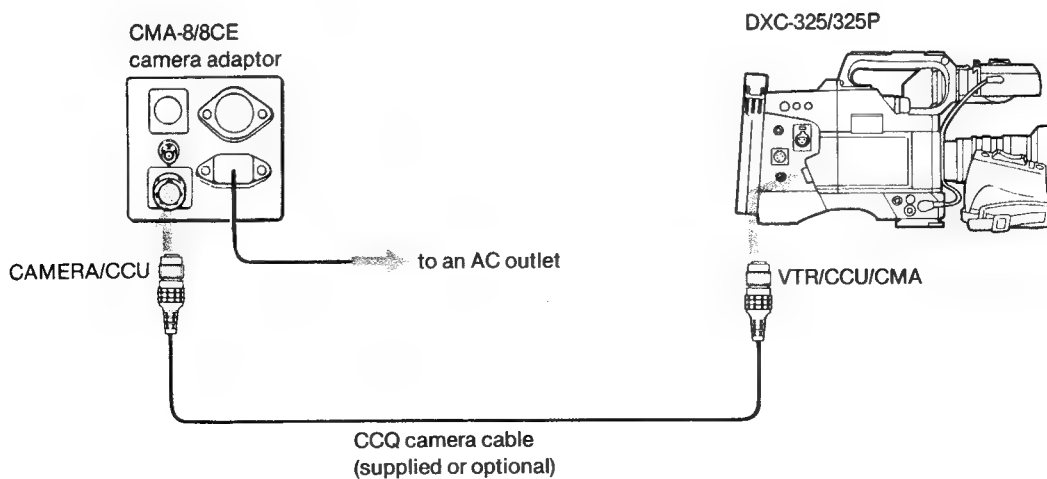
Power from a CCU-M3/M3P camera control unit

When the CCU is powered by the battery pack, the life of the battery pack installed in the CCU is indicated by the BATT indicator of the viewfinder.

For details on the power sources for the CCU, refer to the CCU's instruction manual.



Power from a camera adaptor



Connections

Before making connections, make sure that the power switches of the camera and other equipment are turned off.

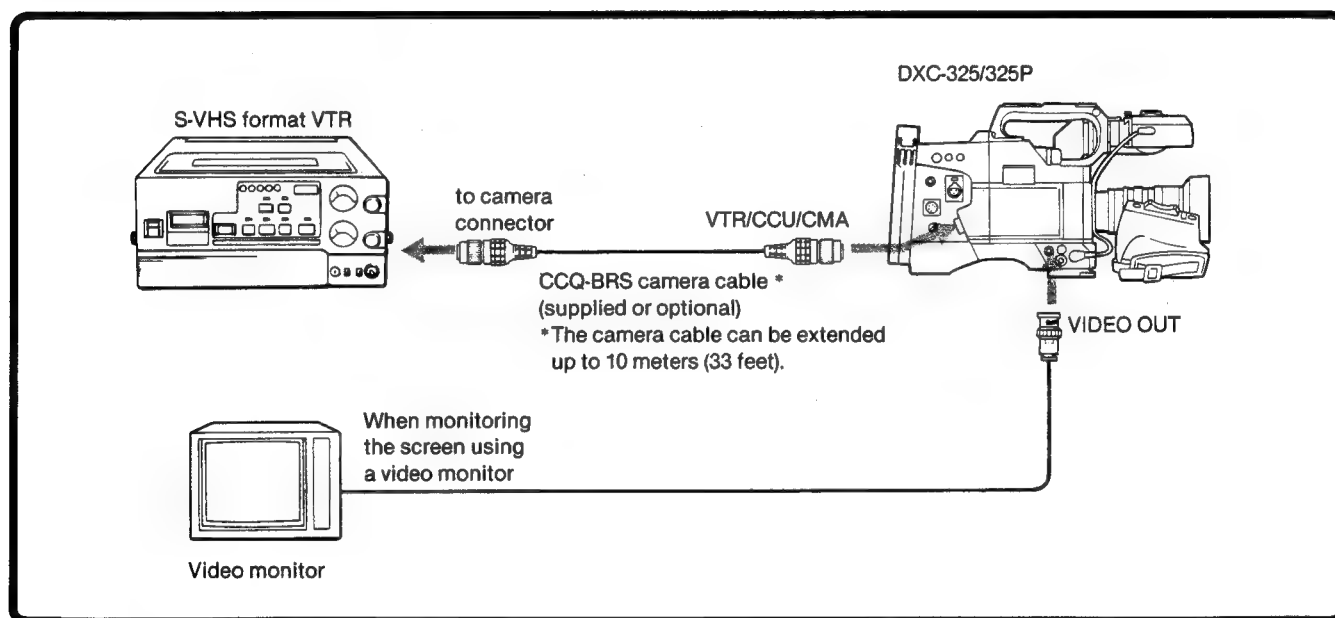
Connection with an S-VHS Format Portable VTR

Set the OUTPUT selector on the camera adaptor to Y/C when you connect an S-VHS format portable VTR.

The video signal output to CCQ camera cable is now the Y/C separate signal.

The video signal output to the VIDEO OUT connector is still the usual composite video signal.

When using a VTR which records with a composite video signal next time, change the setting of the OUTPUT selector to VBS.



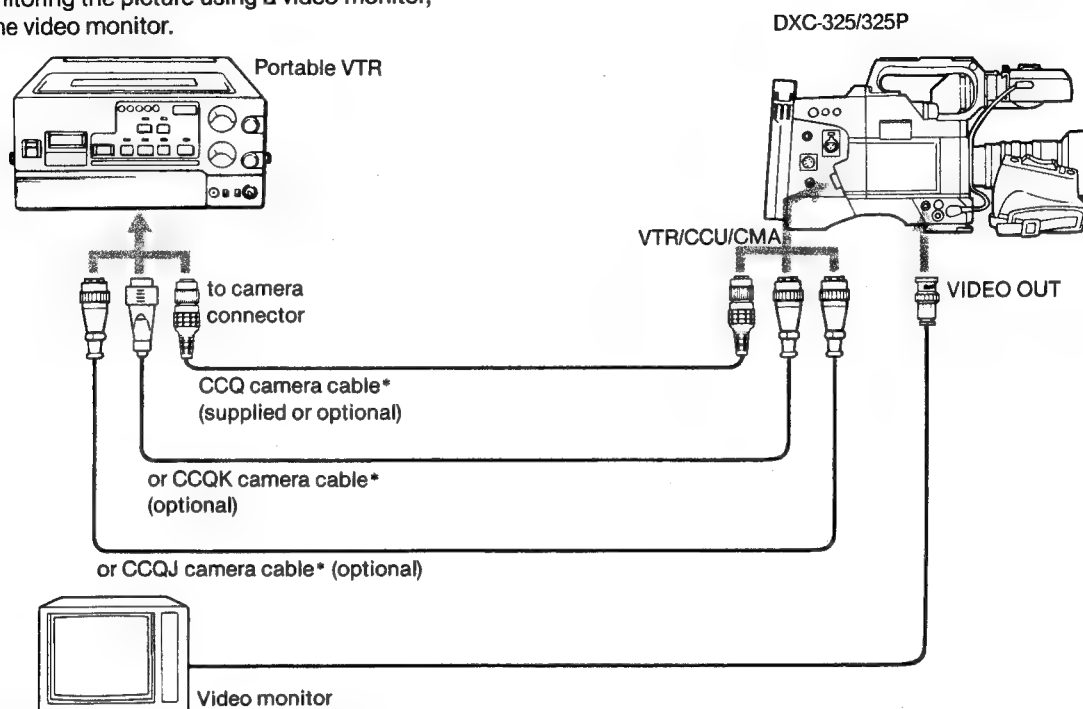
Notes

- Picture monitoring of the Y/C separate signal is possible if the monitor is equipped with the S video input jacks. Connect the VTR and the S video input jacks of the monitor. In this case, connection between the VIDEO OUT connector of the camera and the monitor is unnecessary.

- Superimposed title characters (see page 46) do not appear on the screen when the Y/C separate signal is output through the CCQ-BRS camera cable. Connect a TGR-325 title generator (Optional) to the TITLE connector, and the characters superimposed by the TGR-325 can be seen on the viewfinder or the monitor connected to the VIDEO OUT connector of the camera.

Connection with a Portable VTR

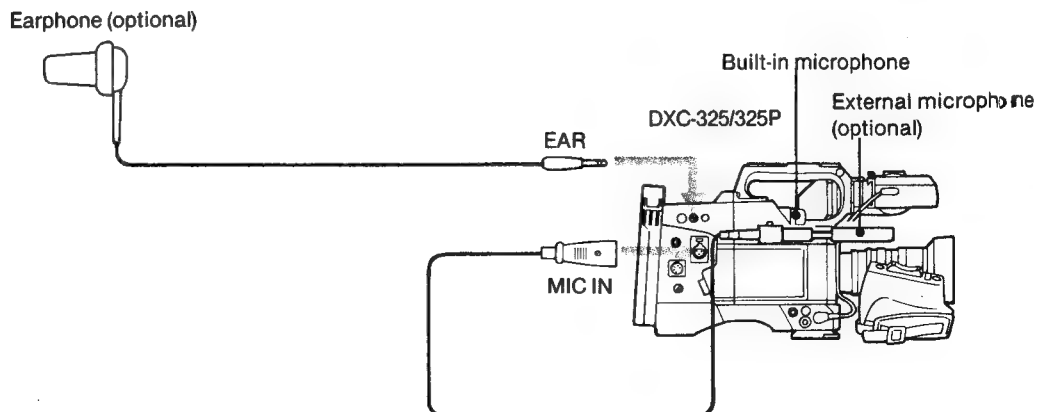
When monitoring the picture using a video monitor, connect the video monitor.



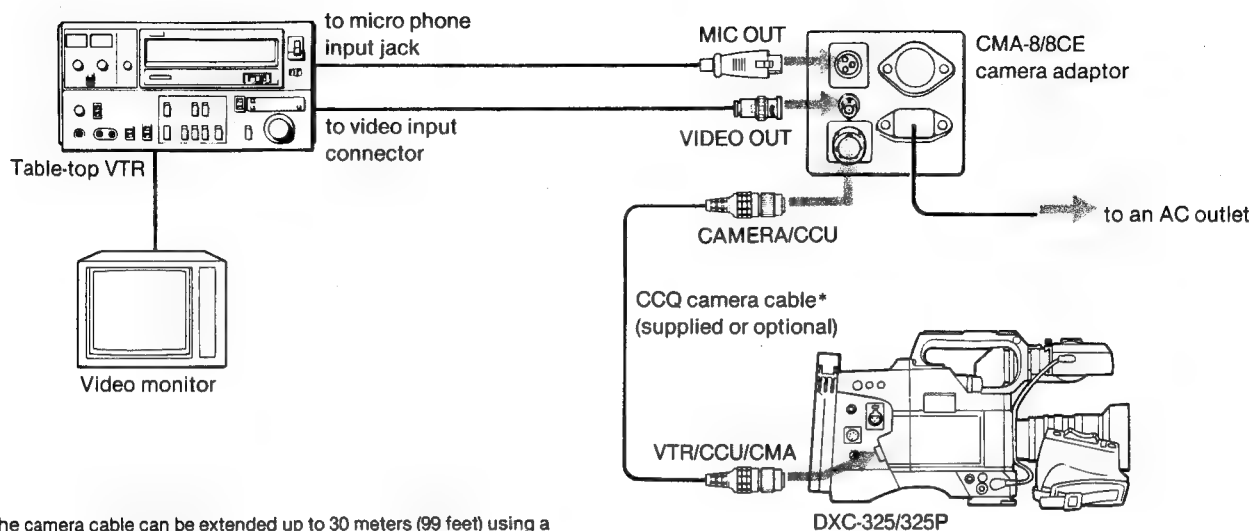
* The camera cable can be extended up to 10 meters (33 feet) using a CCQ camera cable. Consult your authorized Sony dealer.

Connection for simultaneous sound recording

To avoid recording noise made while handling the camera, connect an external microphone to the MIC IN connector. The built-in microphone will be automatically shut off.

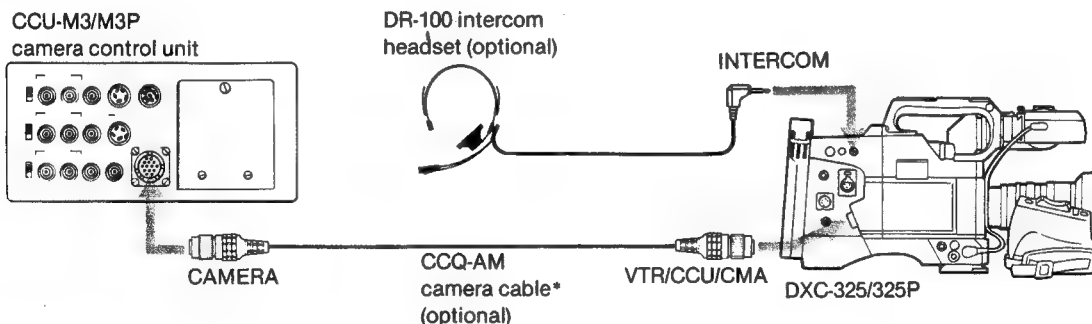


Connection with a Table-Top VTR



* The camera cable can be extended up to 30 meters (99 feet) using a CCQ camera cable. Consult your authorized Sony dealer.

Connection with a CCU-M3/M3P Camera Control Unit



* The camera cable can be extended up to 100 meters (330 feet) using a CCQ-AM camera cable. Consult your authorized Sony dealer.

Notes on operation with the CCU-M3/M3P

- When the camera is connected to the CCU-M3/M3P camera control unit, set the selectors as follows:
 - VTR selector: 1
 - OUTPUT selector: VBS
- When the camera is connected to the CCU, the following switches will not operate: GAIN selector, BARS/WB selector, H PHASE control, SC PHASE control and SC phase selector.
- The MIC IN connector of the camera cannot be used as an external microphone input.

- When the CCU's W/B BALANCE selector is set to PRESET or MANUAL, it adjusts the white balance and takes priority over the camera. If the W/B BALANCE selector is set to AUTO, the white balance can be adjusted by either the camera or the CCU. Automatic black balance adjustment is performed by setting the AUTO W/B BAL switch of the camera to BLK, irrespective of the position of the W/B BALANCE selector of the CCU.

Function of the Connected VTR

VTR selector	Microphone level	Connected VTR	Remote control of VTR start/stop	REC indicator		BATT alarm indication	Audio monitor (on the camera)	Picture shown on the viewfinder		Cable for connection: cable length	Power supply from VTR to camera (See note 1.)	AC power adaptor for VTR
				REC indication	VTR alarm			During recording	During play-back			
1	-60 dB (See note 2.)	VO-6800 (NTSC) VO-6800PS (PAL)	Yes	Yes	Yes	Yes	Yes	Yes Camera	Yes VTR	CCQ-nBRS	Yes	CMA-8 (NTSC) CMA-8CE (PAL)
		VO-4800 (NTSC) VO-4800PS (PAL)	Yes	Yes	Yes	Yes	Yes	Yes Camera	Yes VTR	CCQ-nBRS	Yes	AC-340B (NTSC) AC-340CE (PAL)
		BVU-50 (NTSC) BVU-50P (PAL)	Yes	Yes	Yes	Yes	Yes	Yes Camera	No	CCQ-nBRS	Yes	AC-500 (NTSC) AC-500CE (PAL)
		BVU-110 (NTSC) BVU-110P (PAL)	Yes	Yes	Yes	Yes	Yes	Yes Camera	Yes VTR	CCQ-nBRS	Yes	AC-500 (NTSC) AC-500CE (PAL)
2	-20 dB	SL-2000 (NTSC) SL-F1E (PAL)	Yes	Yes	Yes	No	Yes	Yes Camera	Yes VTR	CCQK-2	No	AC-220 (NTSC) AC-F1E (PAL)
3	-20 dB	HR-C3 (JVC, NTSC) HR-2200 (JVC, PAL)	Yes	Yes	No	No	Yes	Yes Camera	Yes VTR	CCQJ-2	No	
4	-20 dB	PV-5000 (Panasonic, NTSC) NV-9400 (Panasonic, PAL) AG-6400 (Panasonic, NTSC, PAL)	Yes	Yes	No	No	No	Yes Camera	Yes VTR	CCQJ-2	No	
		AG-7400 (Panasonic, NTSC, PAL)	Yes	Yes	No	No	Yes	Yes Camera	Yes (See note 3.)	CCQ-nBRS	No	

Notes

- For VTRs with "No" in the column "Power Supply from VTR to Camera", the power supply from the VTR is insufficient to operate a camera. Therefore, the independent power source must be provided for the camera. If the camera is operated without being powered independently, heat will build up in the VTR or AC power adaptor, and the protective circuit will activate. Consequently, the VTR or AC power adaptor will not operate properly.
- When the VO-6800/6800PS portable VTR is connected to the camera, the VTR's -20 dB/-60dB camera microphone input level selector is set to -60 dB.
- A picture from a VTR can be seen only when the REST button is pressed.

If the operating conditions of the VTR are different from those shown above, the VTR might not operate normally. If you use a VTR other than those shown above, or which the VTR selector must be set to "3" or "4", check the signal levels and other operating conditions.

Adjustments

Preparation

Check to be sure that the connections are made correctly, and set the switches as shown.

Iris selector → "A"
(See page 34.)

ABL switch → OFF

Remove the lens cap.

FILTER selector → appropriate position
(See page 34.)

BARS/WB selector → AUTO

GAIN selector → 0 dB
(See page 39.)

POWER switch
→ ON

VTR selector
↓
appropriate position
(See page 29.)

Point the camera at the object. While zooming
in or out, turn the focus ring to focus the picture.

Video Monitor Adjustment

When a color video monitor is being used to monitor a picture, adjust the color of the monitor as follows.

- 1** Set the BARS/WB selector to BARS.
- 2** Adjust the color and hue controls on the monitor while viewing the color bars on the monitor screen.
- 3** Set the BARS/WB selector to AUTO.

Filter Selection

The color temperature changes according to lighting conditions. To compensate this, use the color temperature conversion filter indicated in the table below.

Filter number	Lighting conditions
1	Iodine lamp, sunrise, sunset
2	Bright outdoor
3	Cloudy, rainy

If the selected filter is not suitable for the lighting conditions, a warning such as ":LOW LIGHT" will be shown on the viewfinder screen. For details on the warning, refer to "Warning Indicators and Character Display" on page 43.

Adjustments

White Balance and Black Balance Adjustments

Proceed with the following white balance and black balance adjustments in order to obtain picture clarity and lifelike color reproduction.

<p>The minimum white area required for adjustment is 10% of the area shown below.</p> <p>Center of the screen and center of this oval.</p> <p>About 80% of the screen height</p> <p>About 80% of the screen width</p> <p>Place the white object in the oval.</p> <p>No other light object should appear inside.</p>	<p>1 Set the FILTER selector properly according to the lighting conditions.</p>
	<p>2 Set the BARS/WB selector to AUTO.</p>
	<p>3 Zoom up on a white object using the same lighting conditions as those under which the recording will be made.</p>
	<p>4 Set the lens iris selector to "A".</p>
	<p>5 Press the AUTO W/B BAL switch toward BLK, and release it. "BLK.:OP" will appear on the viewfinder screen during the automatic black balance adjustment. After the adjustment is completed, "BLK.:OK" will be displayed for a few seconds.</p>
	<p>6 Press the AUTO W/B BAL switch toward WHT, and release it. "WHT.:OP" will appear on the viewfinder screen during the automatic white balance adjustment. After the adjustment is completed "WHT.:OK" will be displayed for a few seconds.</p>

Note

Readjustments of the white balance and black balance are necessary under the following conditions.

White balance:

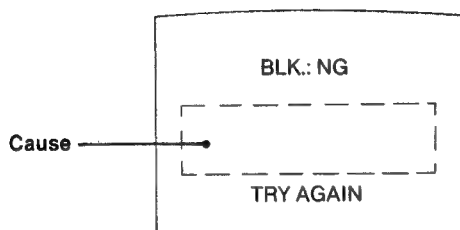
- Each time the lighting conditions are changed
- If the "MEMORY NG" is displayed on the viewfinder screen, indicating the previous white balance value is no longer retained in the memory.

Black balance:

If the "MEMORY NG" is displayed on the viewfinder screen, indicating that the previous black balance value is no longer retained in the memory.

If the automatic black balance adjustment function does not work normally:

The following indications will appear on the viewfinder screen.



:LENS CLOSE?

Cause: The lens iris did not close automatically during black balance adjustment.

Check:

- The lens function
- The lens connection

:CB SW MISS TOUCH?

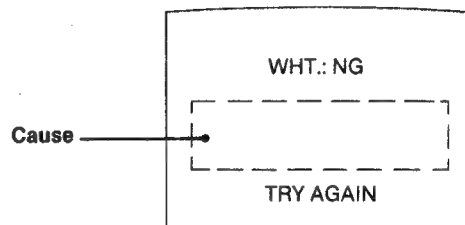
Cause: The BARS/WB selector is set to BARS during the black balance adjustment.

Check: The BARS/WB selector. Is it set to AUTO?

Try to make the black balance adjustment again after eliminating the problems described above.

If the automatic white balance adjustment function does not work normally:

The following indications will appear on the viewfinder screen.



:C. TEMP. LOW CHG. FILTER

or

:C. TEMP. HI CHG. FILTER

Cause: An inappropriate color temperature conversion filter was used.

Check: The filter type

:????

Cause:

- A white object was not used to make the adjustment.

- The adjustment was made with a very bright object inside the minimum white area required for white balance adjustment.

Check: The white pattern or object, and refer to Step 3 of the "White Balance and Black Balance Adjustments".

:LOW LIGHT

Cause: The light is insufficient.

Check:

- The lighting. If necessary, increase it.
- The video output level. If necessary, raise it using the GAIN selector.

Try to make the white balance adjustment again after eliminating the problems described above.

Memorized white balance and black balance values

In the DXC-325/325P, a built-in memory stores the adjusted white balance and black balance values. The memorized values will be retained for about 12 hours after the power is turned off without any further power supply to the camera or until the adjustments are made once again. If the memorized values are erased, "MEMORY NG" will be displayed on the viewfinder screen next time the camera power is turned on. If this happens, adjust the white balance and black balance.

To start recording immediately without white balance adjustment

Set the BARS/WB selector to 3200 K to obtain the white balance value preset at the factory.

Black setting

When the AUTO W/B BAL switch is set to BLK, the black level drift (with respect to the reference black level) of each channel (R, G, B) is automatically adjusted, together with the black balance.

Operation

Preparation

Before operation, set the switches as follows.

Adjust the contrast, brightness and diopter.

ABL → OFF

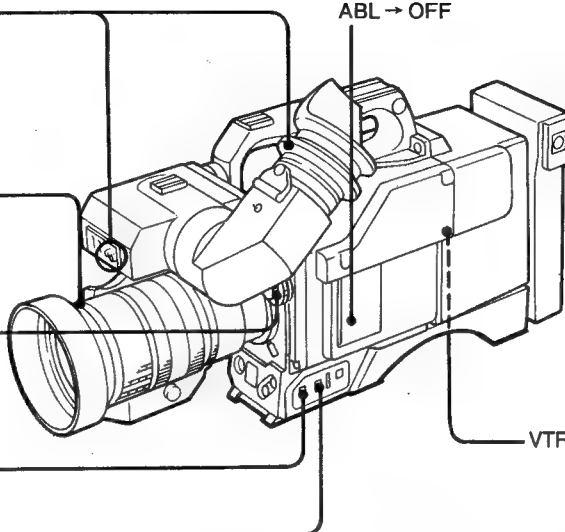
Iris selector → A

FILTER → appropriate position for lighting condition

GAIN → 0 dB

BARS/WB → AUTO

VTR selector → appropriate position for the VTR



Recording with a Portable VTR (connected with a CCQ, CCQK or CCQJ camera cable)

1

Turn the camera and the connected equipment on.

2

Adjust the black balance and white balance. For details, refer to "White Balance and Black Balance Adjustments" on page 35.

3

Point the camera at an object and adjust the lens.
—Iris (See page 34.)
—Zoom (See page 39.)
—Focus

4

To start recording, press the VTR START/RETURN VIDEO button on the camera or the VTR button on the lens. The REC/TALLY indicator in the viewfinder will light during recording.

To stop recording, press the VTR START/RETURN VIDEO button or the VTR button again.

Note

For a brief period after the camera has been turned on, the BATT indicator of the viewfinder may light and random characters may be displayed on the viewfinder screen. (This is not a malfunction.)

Monitoring the sound

The sound can be monitored during both recording and playback through an earphone connected to the camera's EAR jack.

Monitoring the picture

The following three types of pictures can be seen on the viewfinder screen when the camera and the VTR are connected with the CCQ camera cable. (For details on the pictures which can be shown on the viewfinder screen, see page 29.)

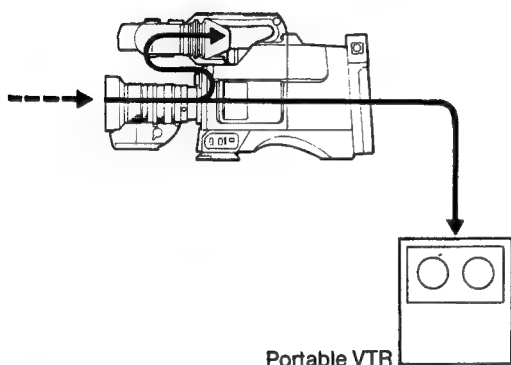
Note

While the playback picture from the VTR is displayed on the viewfinder screen, a part of the camera's video signals, such as a sync signal, may be mixed with the playback picture so that streaks of noise roll vertically or horizontally.

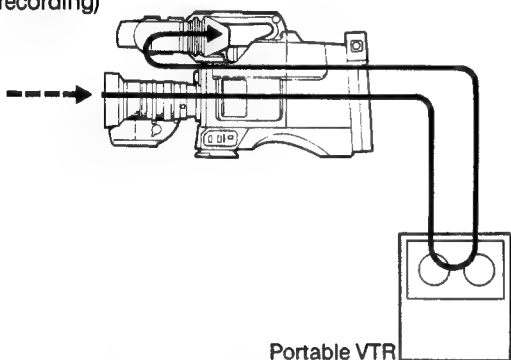
E-E (Electric-to-Electric) mode

The input video signal to the VTR passes through the amplifier in the VTR and output from the video output connector without passing the video recording head and tape. The input signal to the VTR can be checked in this mode.

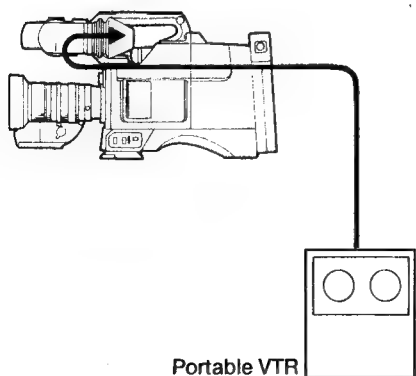
Picture picked up by the camera (during recording)



E-E mode picture from the VTR (return video) when the RET button on the lens is pressed (during recording)



Playback picture (during playback)



Output Level Adjustment

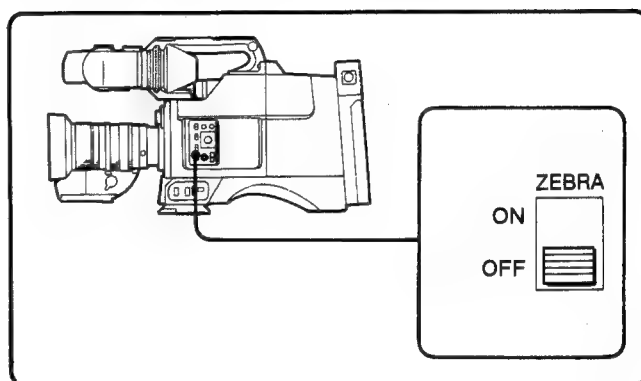
If a clear picture cannot be obtained because of insufficient lighting, set the GAIN selector to the appropriate position. Normally set the GAIN selector to "0".

The video output level can be raised by 9 dB by setting the GAIN selector to "9" and by 18 dB by setting the selector to "18".

Checking the Video Level

When the ZEBRA switch is set to ON, a zebra pattern will appear on the part of the viewfinder screen when the video output level of the picture is 70 to 80 IRE (for NTSC) or 490 to 560 mV (for PAL). You can use this zebra pattern as a reference when adjusting the iris manually. Adjust the iris so that the zebra pattern appears over the subject being shot (for example, the face of a back-lit person).

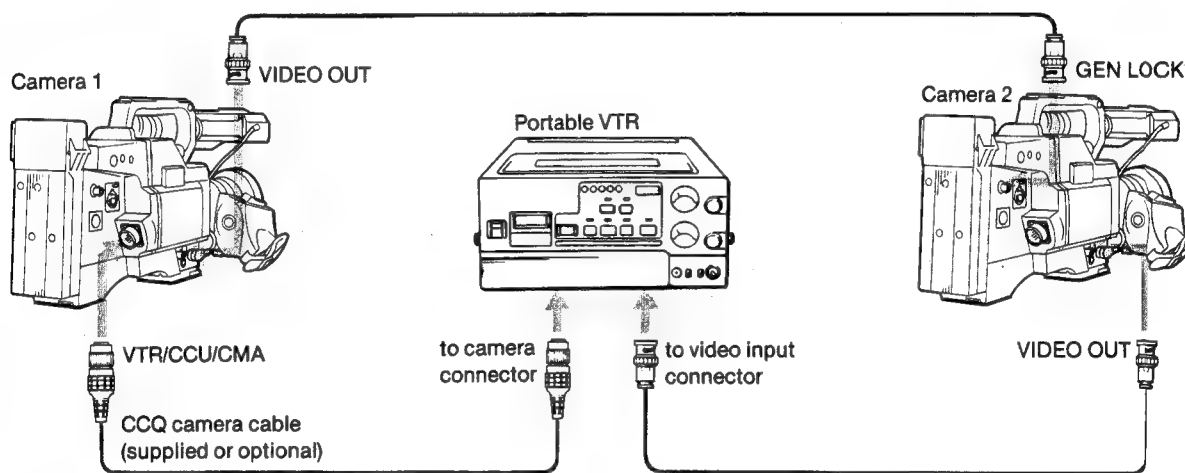
If it is not necessary to use the zebra pattern to adjust the iris, set the ZEBRA switch to OFF.



Use of the GEN LOCK Connector

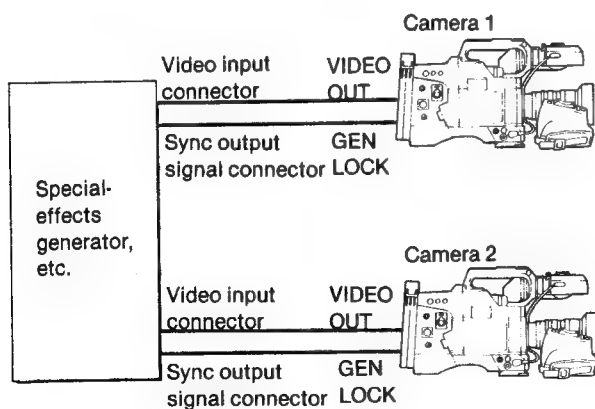
When the BS or VBS signal is connected to the GEN LOCK connector, the camera synchronizes with the connected signal. Use this connector when two or more cameras are used without a CCU.

Example 1



Camera 2 is synchronized with Camera 1.

Example 2



Camera 1 and Camera 2 are synchronized with a special-effects generator.

Adjustment of the picture tone for two or more cameras

When two or more cameras are used simultaneously in connection with a special-effects generator, etc., supply each camera with the same reference signal, and adjust each camera to obtain the same picture tone. Adjust the SC (subcarrier) phase and the H (horizontal) phase following the procedures described below.

Subcarrier phase adjustment

Adjust the subcarrier phase roughly with the SC phase selector, and make fine adjustment using the SC PHASE control. Use a vectorscope to make the adjustment easily.

Horizontal phase adjustment

Adjust the horizontal phase with the H PHASE control. Use a waveform monitor or an oscilloscope to make the adjustment easily.

Operation

Recording with a Table-Top VTR

The operating procedure is almost the same as when recording with a portable VTR except for the following:

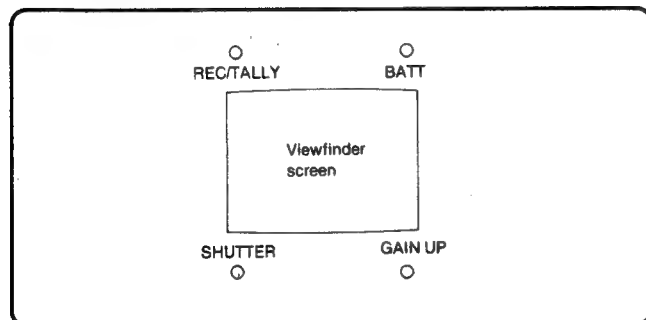
- The VTR START/RETURN VIDEO button on the camera and the VTR button on the lens do not function. Recording must be started and stopped with the function buttons on the VTR.
- The REC/TALLY indicator in the viewfinder does not function.
- The E-E mode picture (return video) and the playback picture cannot be monitored on the viewfinder screen.

Warning Indicators and Character Display

Warning Indicators on the Viewfinder

The following indications show the status of the connected camera, VTR or CCU.

(Some VTRs might have no indication function by blinking or by lighting up.)



Indicator	When operate	Blinks	Lights up
REC/TALLY	While recording, using a VTR connected with a CCQ cable	Until the VTR is put on the standby mode	During recording
	During use of a VTR (equipped with a warning system), which is connected with a CCQ or a CCQK cable	While the VTR is malfunctioning	—
	During use of the CCU-M3/M3P	—	When a tally signal is transmitted from a video switcher, etc.
BATT	• When a camera powered by a built-in NP-1A is used	—	The battery power is weak.
	• When a VTR is connected to the camera	The battery power is weak.	When a connected equipment is continuously operated after blinking
	• When a CCU is connected to the camera*		
SHUTTER	Any time	—	When the SHUTTER ON/OFF switch of the camera is set to ON.
GAIN UP	Any time	—	When the GAIN selector is set to 9 dB or 18 dB

* The indicator's blinking speed denotes the following:

Slow: The battery is weak.

Fast: The CCU's switches and controls are being used.

DXC-325 (UC)

DXC-325P (EK)

Warning Indications on the Character Display

The following indications appear on the viewfinder screen.

:LOW LIGHT

Meaning: The lighting is insufficient.

Check: The lighting. Increase it, if necessary.
The iris. Open the iris manually or activate the auto iris function.
The filter. Select an appropriate filter.
The GAIN selector. Set it to 9 dB or 18 dB.

It is possible to switch the "LOW LIGHT" indication on or off.

On: Press the UP/ON button when the character display is on the "Operational Status of the Camera" mode.

Off: Press the DOWN/OFF button when the character display is on the "Operational Status of the Camera" mode. The indication does not appear on the viewfinder screen even if the lighting is insufficient.

:MEMORY NG

Meaning: The white balance and black balance adjusted values are no longer retained in the memory.

Check: The white balance and black balance values. Reset them.

:BATT :EMPTY?

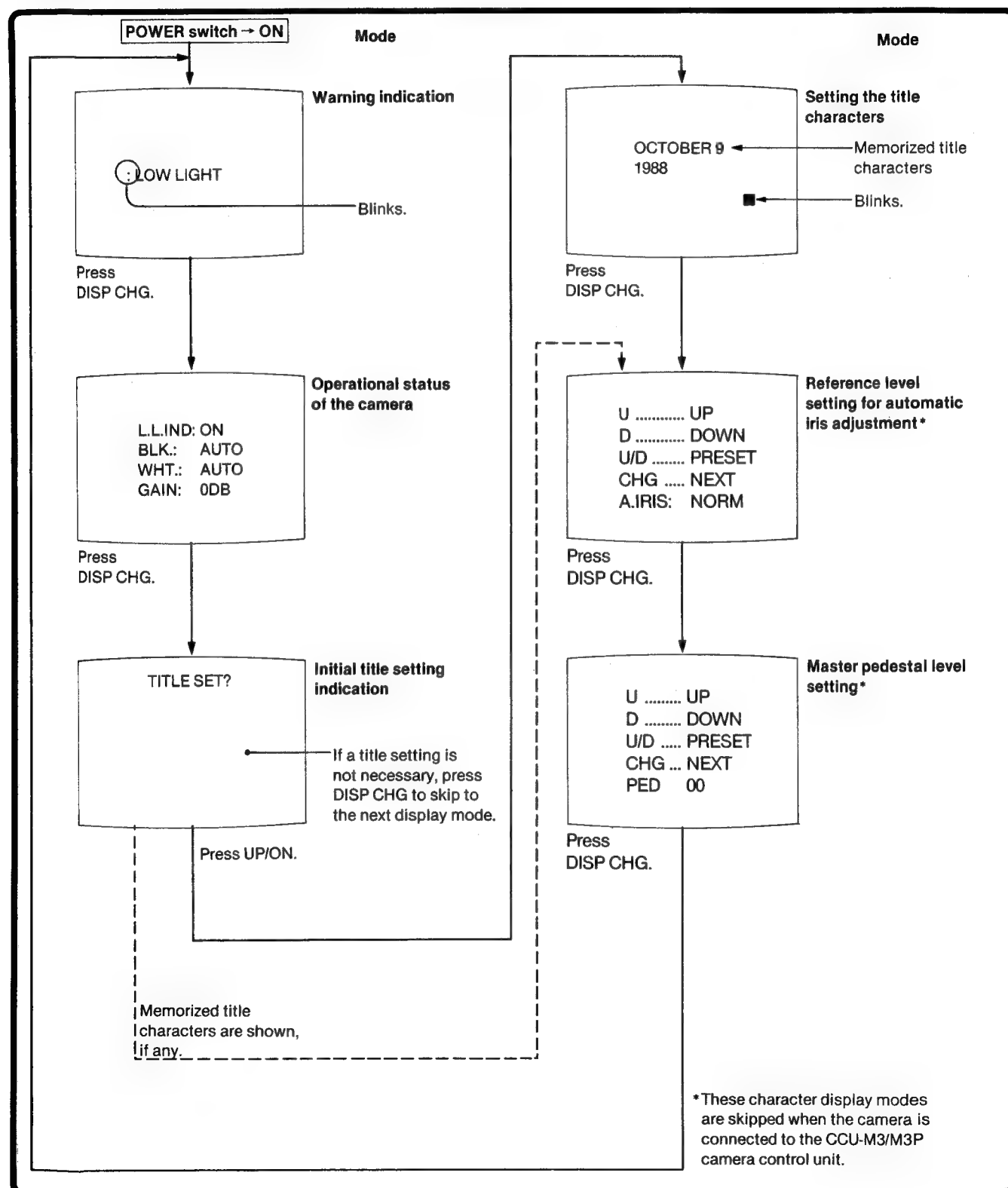
Meaning: The input voltage to the camera is less than about 11.0 V.

Check: The battery. Replace it with a fully charged one.
If you continue recording with a weak battery, the quality of the recording will deteriorate.

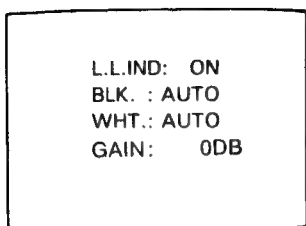
Warning Indicators and Character Display

Character Display on the Viewfinder

The following chart shows the character display mode sequence each time the DISP CHG is pressed.



Operational status of the camera



L.L. IND (Setting the "LOW LIGHT" indication)

ON: "LOW LIGHT" is displayed.
OFF: "LOW LIGHT" is not displayed.

BLK. (Black balance adjustment mode)

AUTO: For automatic adjustment
MANUAL: For manual adjustment using the CCU-M3/M3P camera control unit

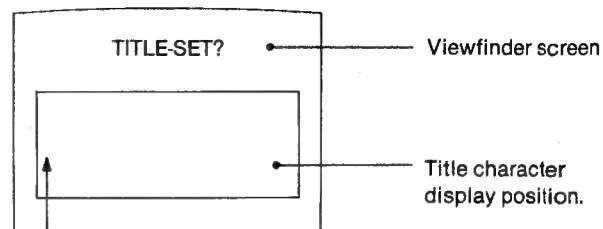
WHT. (White balance adjustment mode)

AUTO: For automatic adjustment
PRESET: For the factory preset value
MANUAL: For manual adjustment using the CCU-M3/M3P

GAIN (Setting the video output level)

0 dB, 9 dB or 18 dB.

Initial title setting indication



If any characters are stored in the memory, they are displayed here.

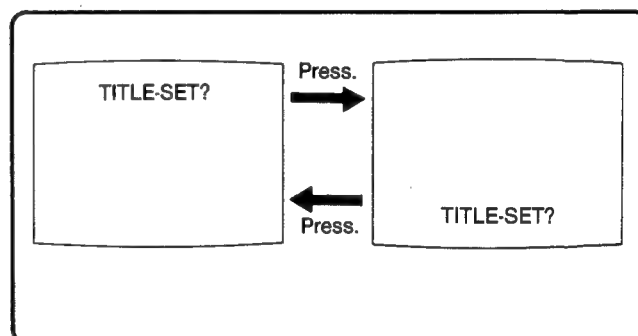
Perform the following procedures if necessary.

To clear all the memorized title characters:

Press the UP/ON button and the DOWN/OFF buttons simultaneously.

To change the character display position:

Press the DOWN/OFF button.



Note

When the camera is used with a VO-6800/6800PS portable VTR, use only the lower character display area, because the VTR tape remaining time is shown in the upper character display area.

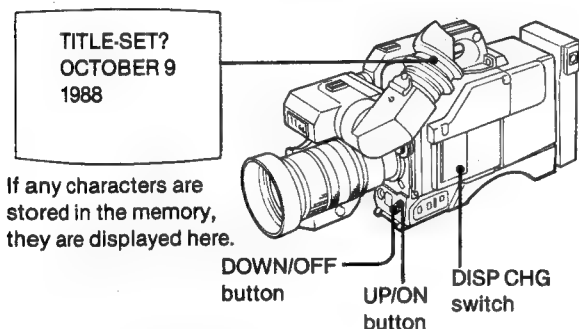
Warning Indicators and Character Display

Setting the title characters

This camera has a superimposition function which allows the simultaneous showing of the picture shot by the camera and the characters by the built-in character generator on the same screen. If a recording VTR or a monitor is connected to the camera, the superimposed picture can be recorded on the VTR or monitored on the monitor screen. Use the DISP CHG switch, UP/ON button, and DOWN/OFF button to set title characters.

Preparation

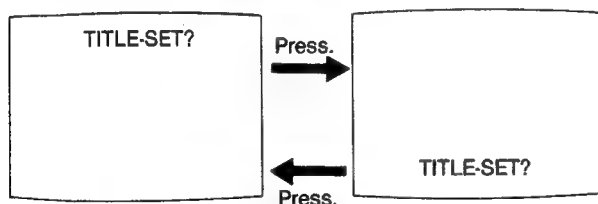
- 1 Press the DISP CHG switch until the following indication appears on the viewfinder screen.



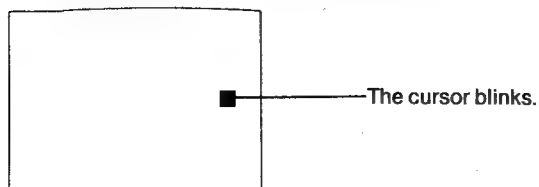
Perform the following procedures if necessary when the indications above are shown on the viewfinder screen.

To clear all the memorized title characters:
Press the UP/ON button and DOWN/OFF button simultaneously.

To change the position of the title characters:
Press the DOWN/OFF button.

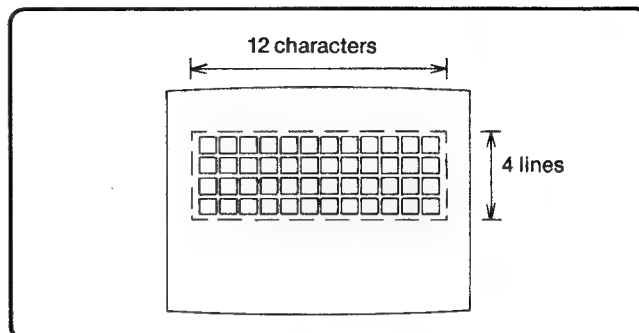


- 2 Press the UP/ON button to set title characters.



Setting procedures

Set title characters one by one using the UP/ON button and DOWN/OFF button. Up to 12 characters can be displayed on one line, and up to 4 lines can be displayed.



Selection of letters

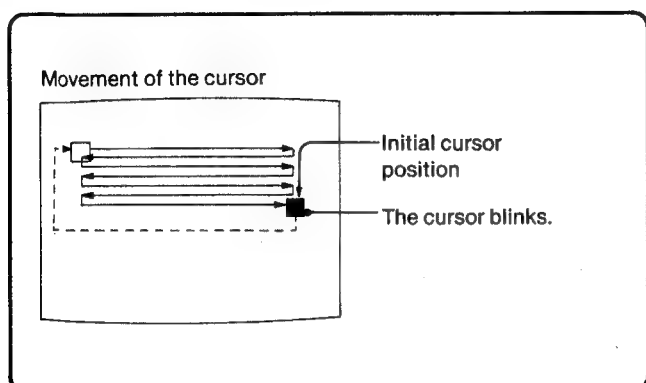
Repeat pressing the UP/ON button until the desired character appears inside the cursor.
Every time the UP/ON button is pressed, the characters change in the following order.

Order of scanning	Punctuation display
<div> <div>→ ABCDEFGHIJKLM.</div> <div>→ NOPQRSTUVWXYZ?</div> <div>→ 0123456789 : . - /</div> </div> <p>Goes back to "A".</p>	Point: "." Space: " " Question mark: "?" Colon: ":" Period: "." Hyphen: "-" Slash: "/"

To change the characters in reverse alphabetical order:
Press the DOWN/OFF button with the UP/ON button pressed.

Moving the cursor

The cursor can be moved to the desired position by repeating the DOWN/OFF button. After the desired character appears, press the DOWN/OFF button, and the cursor moves one space to the right.



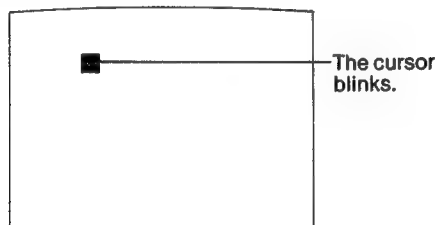
Notes

- The AUTO W/B BALANCE switch can also be used for character setting instead of the UP/ON and DOWN/OFF buttons. To set the character position, set the switch to BLK (same function as the DOWN/OFF button), and to set the character, set the switch to WHT (same function as the UP/ON button).
- To replace a character which has been set with a new one, return the cursor to the character's position, select the desired character with the UP/ON button, and press the DOWN/OFF button. The characters must be changed one by one as it is described in this section.

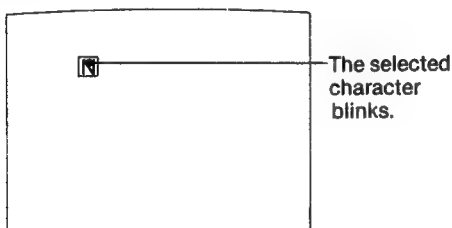
Memory of the title characters

The characters and their displayed positions are stored in the memory (about 12 hours) after the character display mode is cancelled or after the power is turned off.

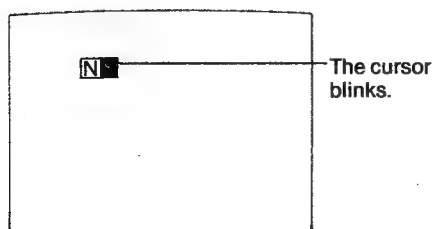
- 1 Move the cursor to the desired position by pressing the DOWN/OFF button.



- 2 Select a character by pressing the UP/ON button.



- 3 Press the DOWN/OFF button to set the selected character, and the cursor moves one space to the right.

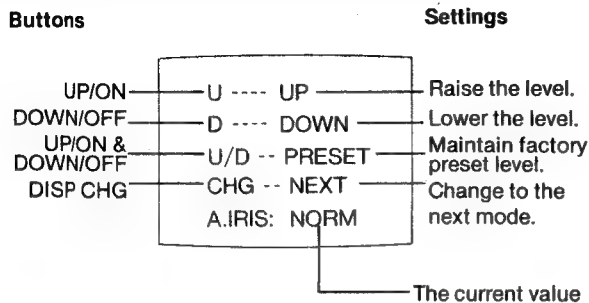


Set the title characters by repeating Step 1 through 3 shown above.

DXC-325 (UC)
DXC-325P (EK)

Warning Indicators and Character Display

Setting the reference level for automatic iris adjustment



Purpose

To adjust the video level of a back-lit subject so that it is not too dark.

Adjustable range

From about -1.0 to +1.0 F stop in about 0.5 increments.

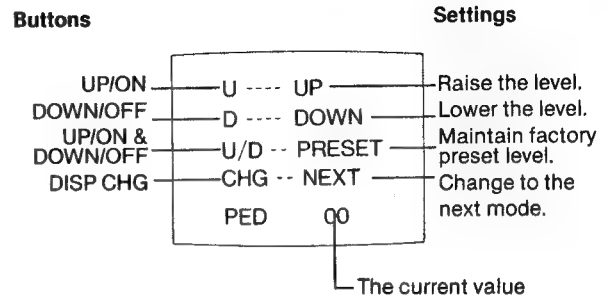
Operation

To raise the level: Press the UP/ON button.
 To lower the level: Press the DOWN/OFF button.
 To reset to the normal level: Press the UP/ON and DOWN/OFF buttons simultaneously.

Maintenance of the adjusted value

The adjusted iris value will be retained in the memory until the power is turned off. The next time the camera power is turned on, the iris value will return to the factory preset level.

Setting the master pedestal level



Purpose

Adjust to obtain a well contrasted picture while shooting outdoors.

Adjustable range

From about -30% to +31% of the reference level (0.7 V as 100%) in about 1% increments.

Operation

To raise the level: Press the UP/ON button. (If this button is pressed when the master pedestal level is +31%, "MAX" is displayed.)
 To lower the level: Press the DOWN/OFF button. (If this button is pressed when the level is -30%, "MIN" is displayed.)
 To reset to "00" (factory preset value): Press the UP/ON and the DOWN/OFF buttons simultaneously.

Maintenance of the adjusted value

The master pedestal level is retained in the memory for about 12 hours after the power is turned off.

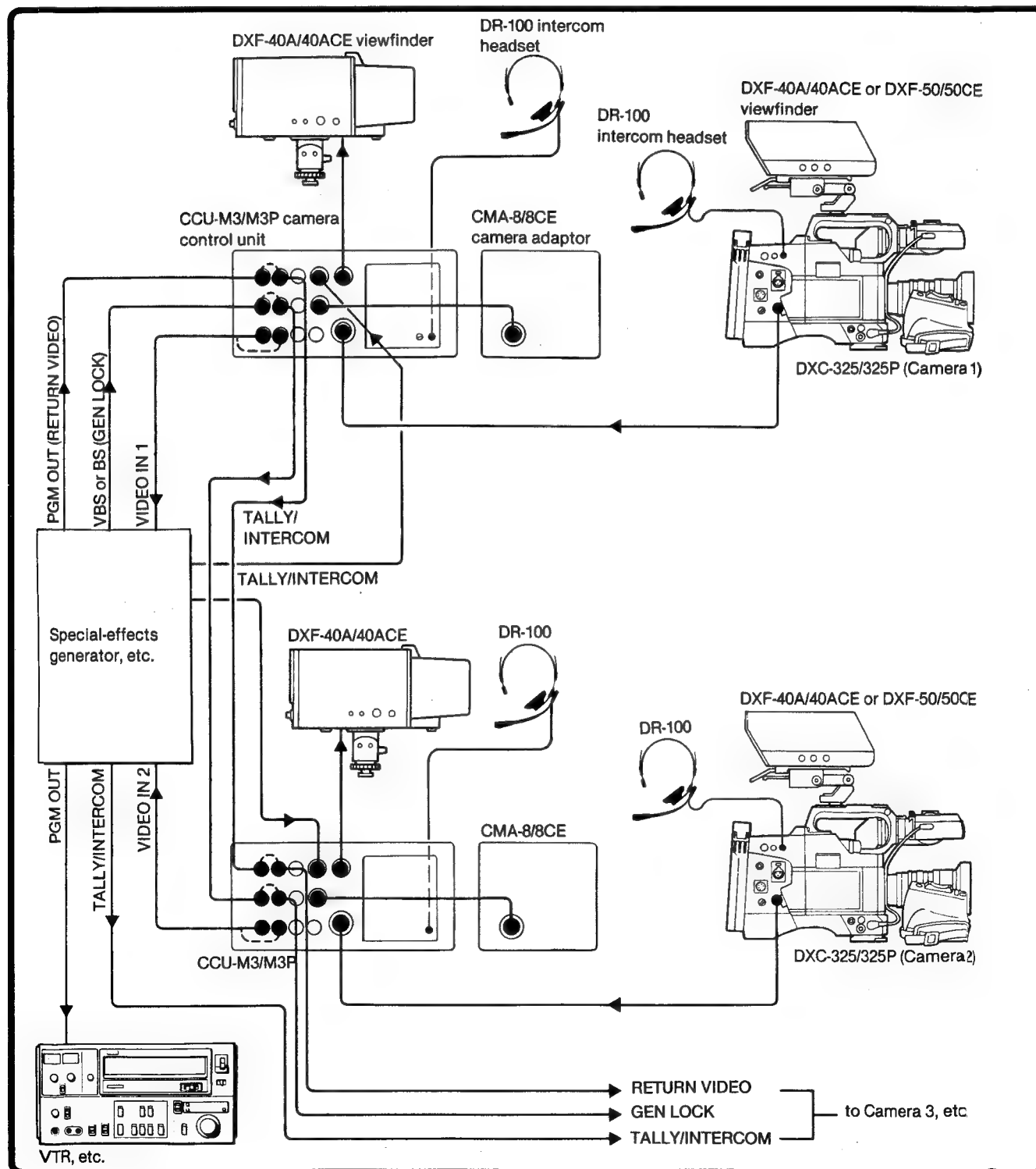
Notes

- If the pedestal level set by the UP/ON and DOWN/OFF buttons is to be monitored on a waveform monitor, set the ABL switch to OFF. If the ABL switch is set to ON, the correct waveform cannot be monitored.
- When a CCU-M3/M3P camera control unit is connected to the camera, the auto iris reference level setting mode and the master pedestal level setting mode cannot be controlled by the camera because the CCU iris and the master pedestal values take priority over the camera settings.
- The CCU master pedestal level setting is stored in the camera's memory for about 12 hours after the CCU is disconnected from the camera.

Studio Use

When using more than two cameras simultaneously in a video studio, a special-effects generator, such as the Sony SEG-2000A/2000AP, is necessary for wiping and switching, and a CCU-M3/M3P camera control unit for matching all the camera's picture quality and color.

System Example



DXC-325 (UC)
DXC-325P (EK)

Hints for Better Shooting

Understanding Light and Color

Brightness levels

The single greatest influence on picture quality is the brightness level. Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording.

When to use an ND filter

Exceptionally bright scenes such as sunny days at the beach in summer or on snow fields in winter will look "washed out" when recorded. To make these scenes recorded naturally, an ND filter (set the FILTER selector to the 2 position) is required.

Unit: lux	Snow-covered mountains Snow fields Sandy beach, clear day in summer
100,000	Clear day, mid-day (100,000) Clear day, mid-afternoon (35,000) Overcast day, mid-day (32,000)
10,000	Overcast day, one hour after sunrise (2,000)
1,000	Office lit by fluorescent lamps, near window (1,000) Clear day, one hour before sunset (1,000)
500	Department store counter (500 ~ 700) Station wicket (650) Office lit by fluorescent lamps (400 ~ 500) Room lit by two 30 W fluorescent lamps (300) Subway station platform (300)
300	Arcade at night (150 ~ 200)
100	Theater lobby (15 ~ 35) Candle light (10 ~ 15)
10	

Color temperature—how it effects white balance adjustment

If the temperature of an object continues to increase, it will eventually begin giving off light. At this time, there is a fixed relationship between the object's temperature and its "light color." The temperature of the object radiating the light is expressed in absolute temperature (K).

This is also known as the color temperature, which in turn stands for "light color." As color temperature increases, the light color changes from red to yellow to white to blue.

Natural light color temperature (K)	Color change	Artificial light color temperature (K)
Clear sky	10,000	10,000(K)
Slightly overcast	8,000	8,000
Cloudy, rainy	7,000	7,000
Direct sunlight	6,000	6,000
2hr.	5,000	5,000
1hr.	4,000	4,000
40min.	3,500	3,500
30min.	3,200	3,200
20min.	3,000	3,000
Time after sunrise/ before sunset	2,500	2,500
Sunrise/sunset	2,000	2,000

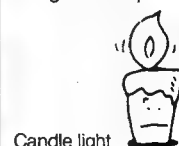


Fluorescent lamp (clear)

Fluorescent lamp (white)

Fluorescent lamp (off white)
Studio lamp
Halogen lamp

Tungsten lamp



Candle light

Basic Camerawork

Getting stable pictures—starts with a correct stance

For hand-held shots, shooting position is the key

Using three basic positions as a reference, practice shooting positions until you find the stance which provides the easiest shooting and best results.



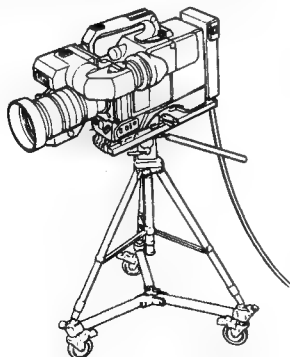
- When kneeling, placing one knee on the ground provides the best stability.
- Place the eye firmly against the viewfinder eyecup.
- For hand-held shots, put the camera on your shoulder and assume a comfortable, stable position. Make sure the camera does not move.
- Relax your shoulders.

- Put your right elbow firmly against your side to help stabilize the camera.
- If you are going to move the unit while recording, keep both eyes open as much as possible.
- Stand firmly with your feet comfortably apart. Leaning against something firm such as a wall or tree will also provide extra stability.

Use a tripod or monopod if possible

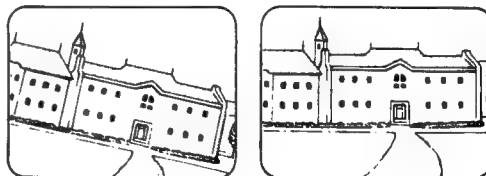
Use a sturdy one.

If a tripod is not available, try placing the camera on a tabletop, wall, or any other flat surface of suitable height.



Keeping the horizontal plane level

Even if camera work is smooth and stable, shots can be tilted or off axis horizontally.



The horizontal plane can be easily determined by using the viewfinder frame as a reference.

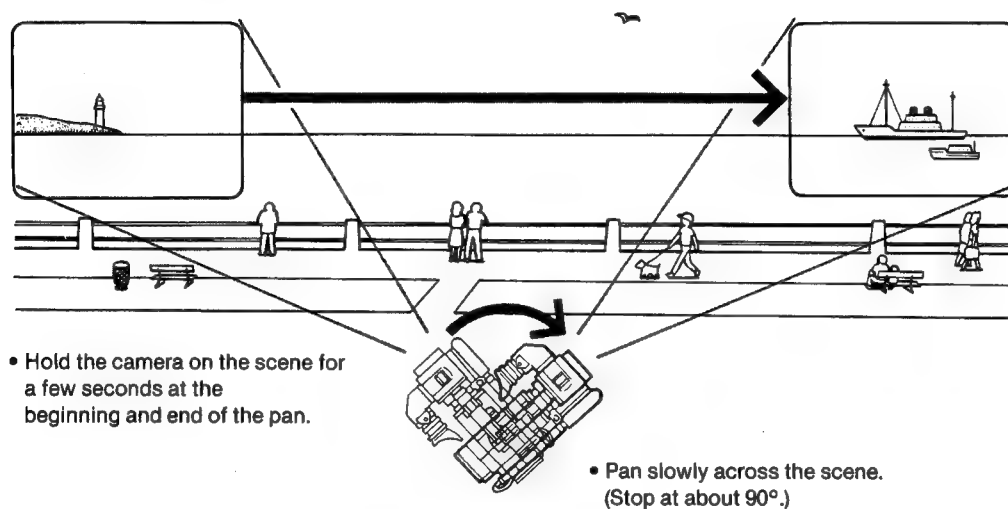
Hints for Better Shooting

Three frequently used shots

These three types of shots will bring additional action and movement to your scenes when properly used. For greatest effect, it is advisable that they not be overused.

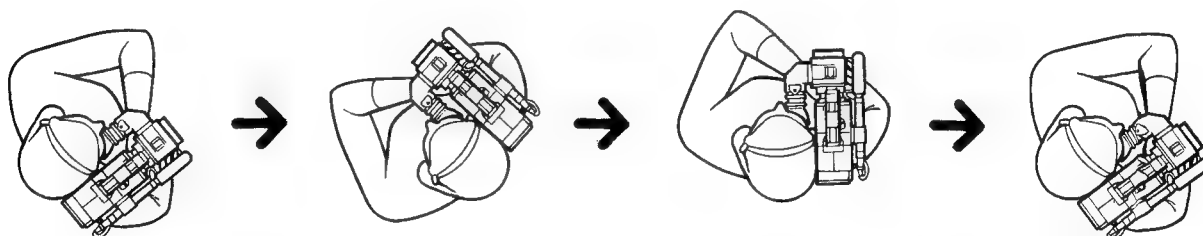
Panning — Moving the camera horizontally

For emphasizing the grandeur of a scene, and for including all of the scenery in a single continuous shot.



For professional-looking pans

- 1 First, stand so that you face in the direction where the pan will end.
- 2 Without moving your feet, rotate your upper body so that your camera faces the direction where the scene will begin.
- 3 Start shooting. Rotate your body slowly to the point where the pan will stop.



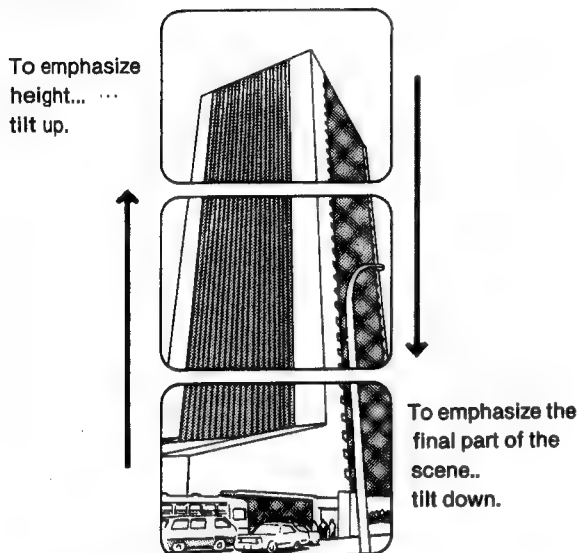
The best panning speed is one that will allow you to explain the scene during playback.

Repeated pans of the same scene should be avoided.

If you can hold your breath during panning and zooming, camera shake can be minimized, and you can concentrate more easily on the scene.

Tilting —moving the camera vertically

Tilting shots with the camera should be slightly faster than pans.

**Zooming** —changing the size of the subject

Because telephoto shots make camera shake more noticeable, the camera should be as stable as possible.

To draw attention to something specific... zoom in.



To end the shot by making the circumstances surrounding the scene understood... zoom out.

**Sizing the scene-mixing long, medium and close-up shots**

Continuous use of long shots or close-ups will give your productions a monotonous "flat" impression. To avoid this, it is important to consider exactly what it is that you wish to "say" with every shot. Indeed, it is possible to change the impression that any subject makes merely by changing the way it's shot.



You don't have to change the subject to alter the scene—you can achieve a different effect by changing the size of the subject itself within the scene.

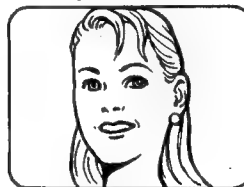
Framing people

Basic shots for properly framing people are shown below.

Experience has shown that shots that frame people differently than this do not have as pleasant an effect.

Face shot

Even if you cut off the hairline, don't cut off the chin.



When shooting a profile, leave the space in front of the face to create a "sight line."

Bust shot—

Chest and above

**Waist shot—**

Upper hips and above

**Knee shot—**

Knees and above

**Full shot—**

Entire body



Hints for Better Shooting

Cutting

Scene length

—not too long, not too short

While there's no hard-and-fast rule, it is generally advisable to make each scene 6—7 seconds in length for easier viewing.

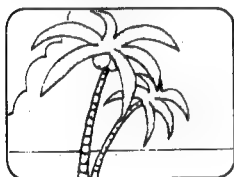
A succession of short scenes can tire the viewer, while long, single scenes can become boring.

Cutting according to the narration

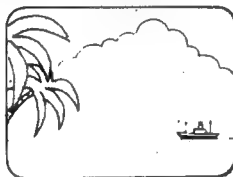
Cut the scene when the narration is finished.

Cutting according to the subject

Close-ups shorter.



Make long shots longer.

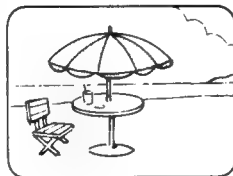


Because long shots have more to see in them than close-ups, show them longer so the viewer may understand what's there.

Make interesting shots and shots in which the subject is constantly moving longer.



Make static shots shorter.



Shoot as if you were watching the playback. That is, it's helpful to occasionally imagine your commentary of the scene even as you're shooting it!

For more effective production

In video, organization is the key

To make a first-class production, it is important to decide the contents and shooting sequence in advance. The first step is to sketch out a simple outline of the actual production based on the time-tested "five W's of journalism" (who, what, where, when, why, how). This will allow you to efficiently and effectively record the many exciting events.

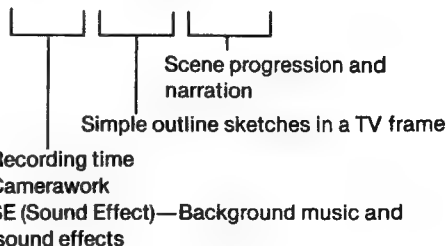
Write a script of what you want to record

After the theme has been decided, think about the progression of the scenes and write down the major points of the "story flow" on paper.

This is called a scenario. When writing the script, it is helpful to scout the location where shooting will take place, and, in the event of school activities or weddings, to obtain a copy of the program in advance, if possible. This will allow you to complete actual recording with a minimum of bother.

Typical scenario

Football Tournament page 1		
5 sec Title		Narration: Mom: X month, Y day at Z field
10 sec Zoom out		Me: I'm all ready to go
6 sec Cut in		
30 sec Cut out Panning		Mom's voice introducing the stadium, atmosphere, etc.
2 min 10 sec		Show the player's ex- pressions
2 min 15 sec Zoom in		Show the ex- citement in the stands



Lighting

For the sharpest pictures, you need the best light

For the most brilliant color in your scenes, a sufficient light level must be maintained. If shooting is done indoors or under other circumstances where light is insufficient, lights must be used for best results.

Choosing the right lights

Photography lamps or halogen lamps are recommended.

For lighting of a wide area for easy use—
reflector flood light

To emphasize the subject—use a reflector
spotlight.

Lighting the subject

The number of lights and their angle to the subject can make a significant difference in lighting effectiveness.

With a single light:

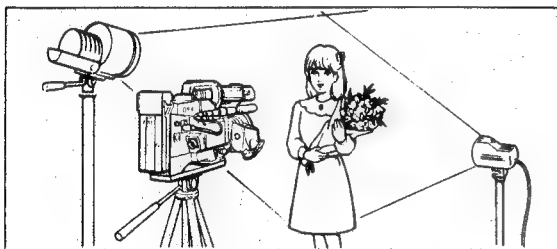
Locate it above and to one side of the subject. With just one light, contrast is unavoidably enhanced.

To eliminate shadows, another light should be added.

With two lights:

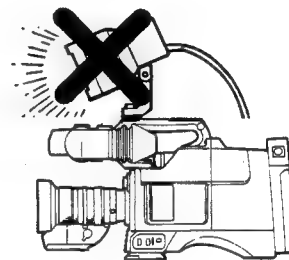
Locate one light above and to one side of the subject, and the second to the side of the subject in such a position that the shadows are eliminated.

If contrast is too strong when lights are used, point a light at the ceiling or reflect it off a sheet of white paper to add soft fill-in light.



Precautions for using lights

- Do not point the light at the camera body. Instead, make sure that it is pointed parallel to the camera or away from it. Be especially careful with lights attached to the accessory shoe.



- Floodlights (lights with wide dispersion) must not be attached to the accessory shoe. Use of a special light stand is recommended.
- Lights become extremely hot during use—do not touch them!
- Do not mix different types of light, as light color temperatures vary and can cause the subject's color to be recorded incorrectly.

For detailed instructions on proper use of lights, carefully read the instruction manuals that accompany them.

Optional Accessories and Recommended Equipment

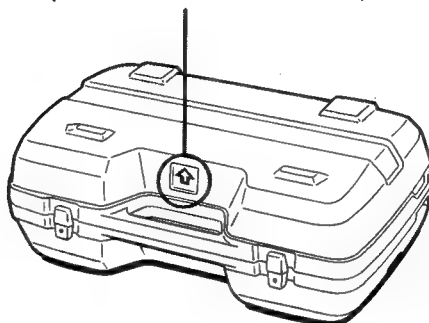
Camera control unit: CCU-M3/M3P
Special-effects generator: SEG-2000A/2000AP, SEG-2550/2550P
Universal chroma keyer: CRK-2000/2000P
Wipe pattern extender: WEX-2000, WEX-2000P/PM
Portable videocassette recorder: VO-6800/6800PS
Electronic viewfinder (5-inch, B/W): DXF-50/50CE
Electronic viewfinder (4-inch, B/W): DXF-40A/40ACE
Electronic viewfinder (1.5-inch, B/W): DXF-325/325CE
Camera adaptor: CMA-8/8CE
Battery pack: NP-1A
Battery charger: BC-1WA/1 WACE
Zoom lens: VCL-810BX
Lens remote control unit: LO-27
Condenser microphone: ECM-672
Microphone holder: CAC-1, CAC-11A

Microphone cable: EC-0.5C2
Intercom headset: DR-100
Camera cable with Q-type 14-pin and K-type 14-pin connectors: CCQK-2
Camera cable with Q-type 14-pin and J-type 10-pin connectors: CCQJ-2
Camera cable with Q-type 14-pin connector: CCQ- 2BRS, CCQ-5BRS, CCQ-10BRS
Camera cable with Q-type 14-pin connector: CCQ-10AM, CCQ-25AM, CCQ-50AM, CCQ-100AM
Tripod attachment: VCT-12
Rack mounting metal: RMM-1800
Carrying case: LC-325
Title generator: TGR-325
2/3-inch lens adaptor LO-32BMT

Packing (Carrying Case LC-325)

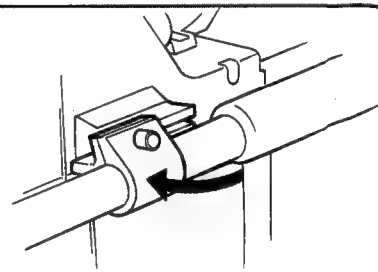
Opening carrying case LC-325

Open the case with this side on top.

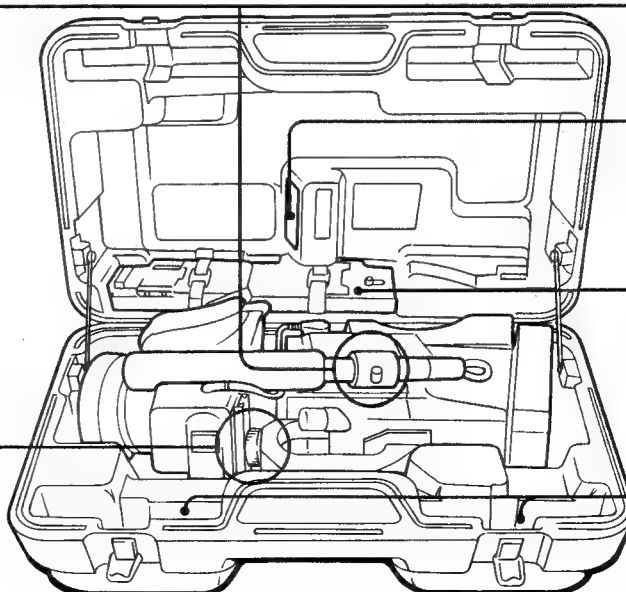
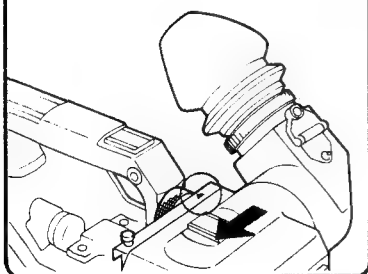


Packing

To store the camera with the microphone mounted
(When CAC-11A is used.)



Slide the viewfinder to the "▶" mark, and tighten the lock ring.



CCQ-23RS
camera cable

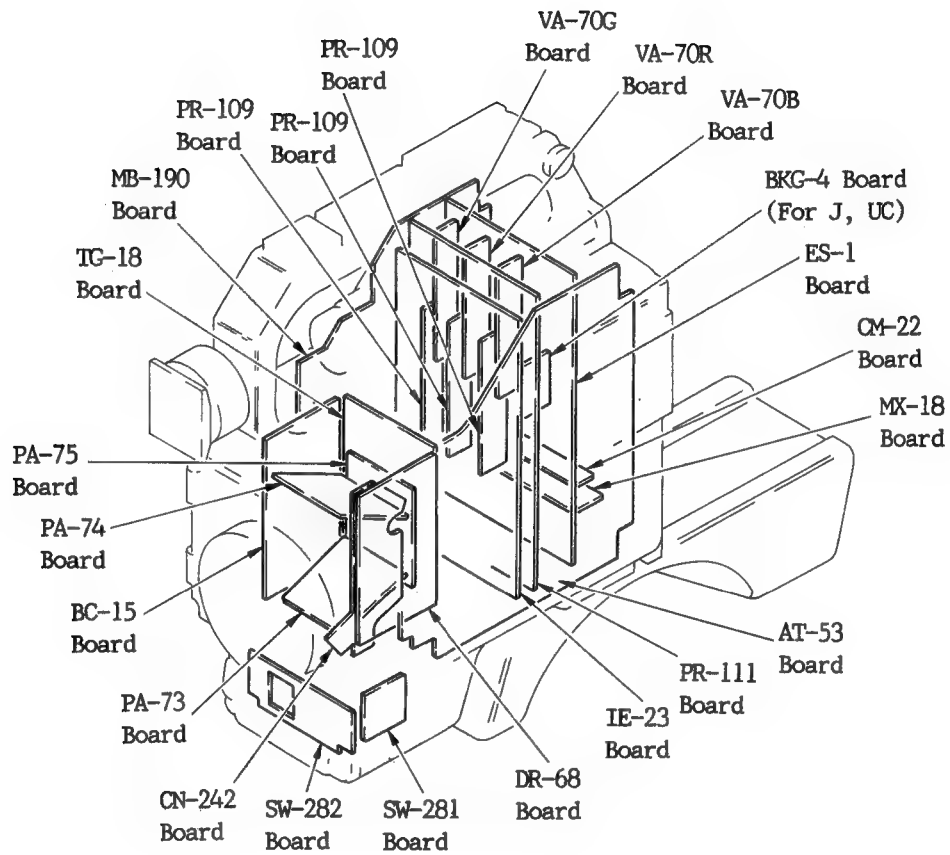
VCT-11
tripod adaptor

NP-1A
battery pack

SECTION 2

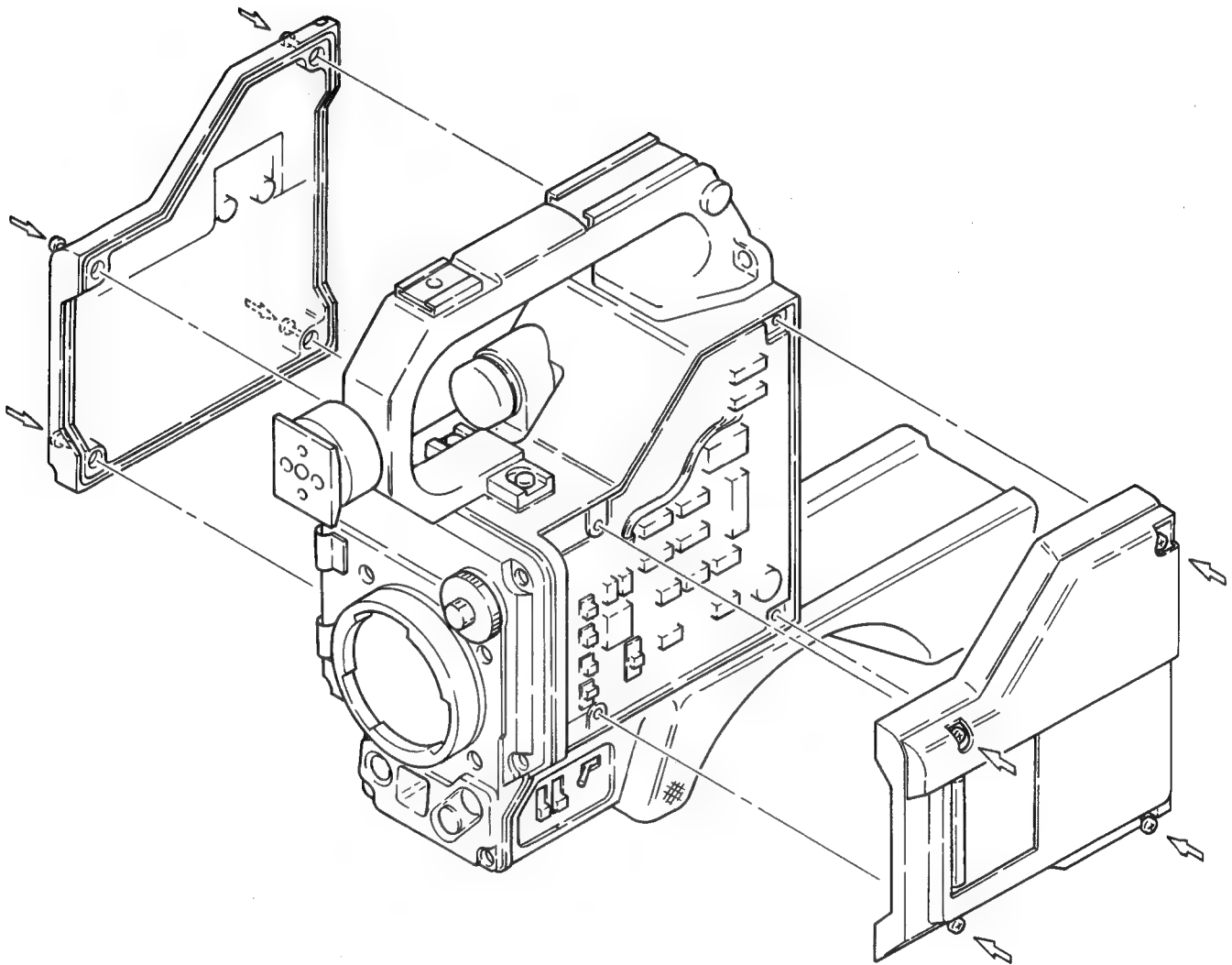
SERVICE INFORMATION

2-1. BOARD LAYOUT



2-2. REMOVAL OF CABINET

Loosen the four screws to remove each side cover.

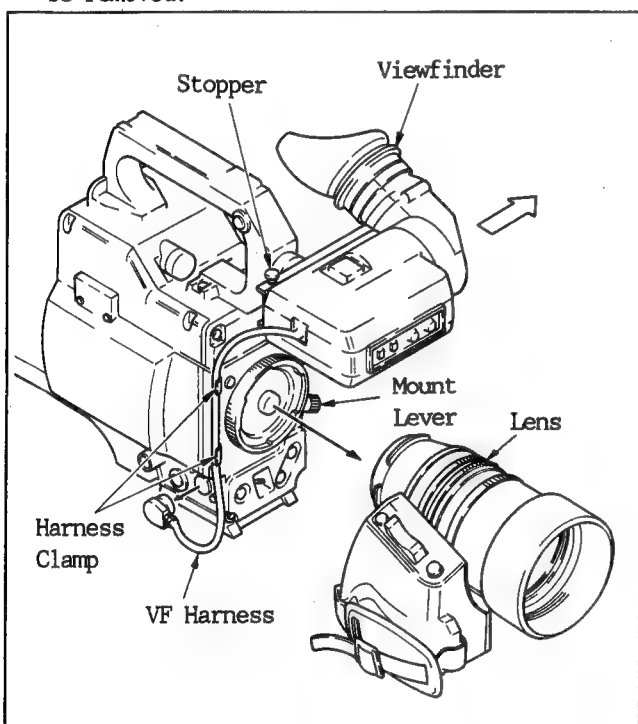


2-3. REPLACEMENT OF MAIN PARTS

2-3-1. Replacement of Front Unit

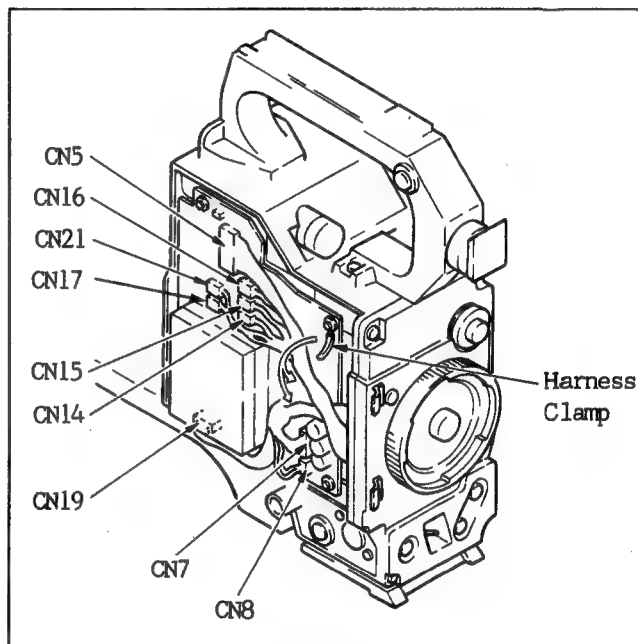
Note: When the CCD block is to be replaced, replace the front unit which contains the CCD block.

1. Turn the mount lever counterclockwise and remove the lens. Release the VF harness from the harness clamp. Pull the viewfinder in the direction of arrow, pulling the stopper of viewfinder. The viewfinder will be removed.

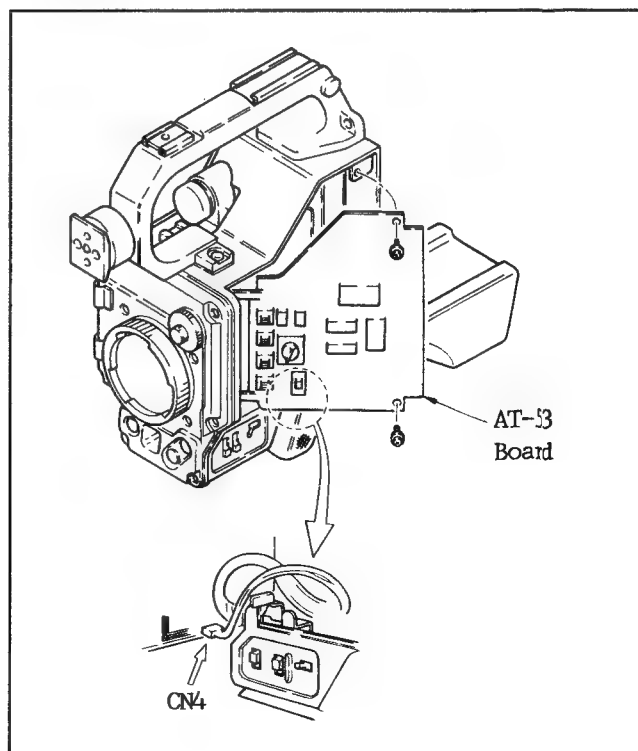


2. Remove the right and left side panels, referring to Section 2-2 "REMOVAL OF CABINET".

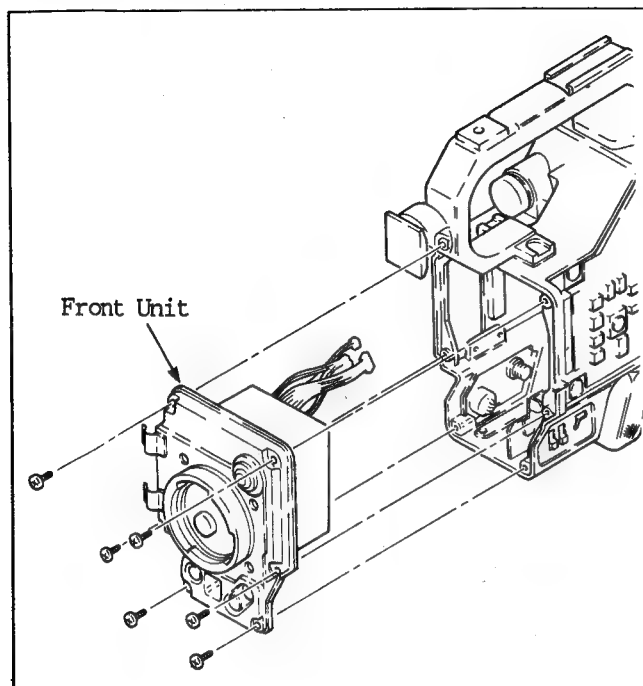
3. Disconnect the eight connectors CN5, CN7, CN8, CN14, CN15, CN16, CN19 and CN21 on the MB-190 board. Release the harness from the harness clamp.



4. Remove the two screws shown in the figure and open the AT-53 board. Disconnect the connector CN4.



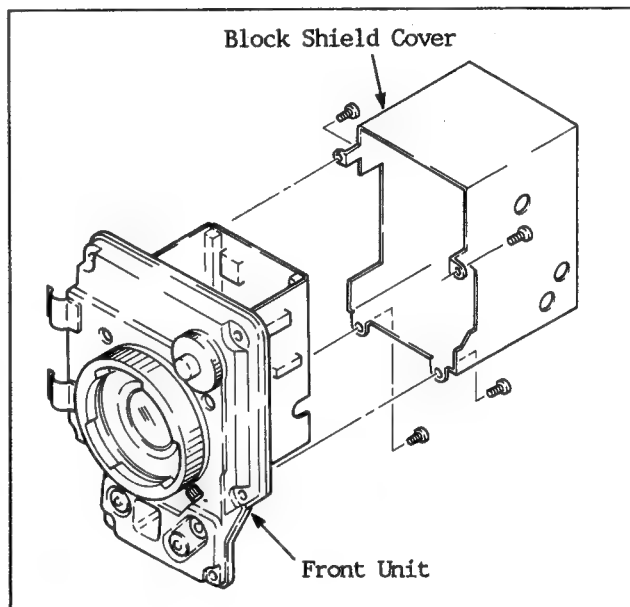
5. Remove the six screws securing the front panel. Pull the front unit out.



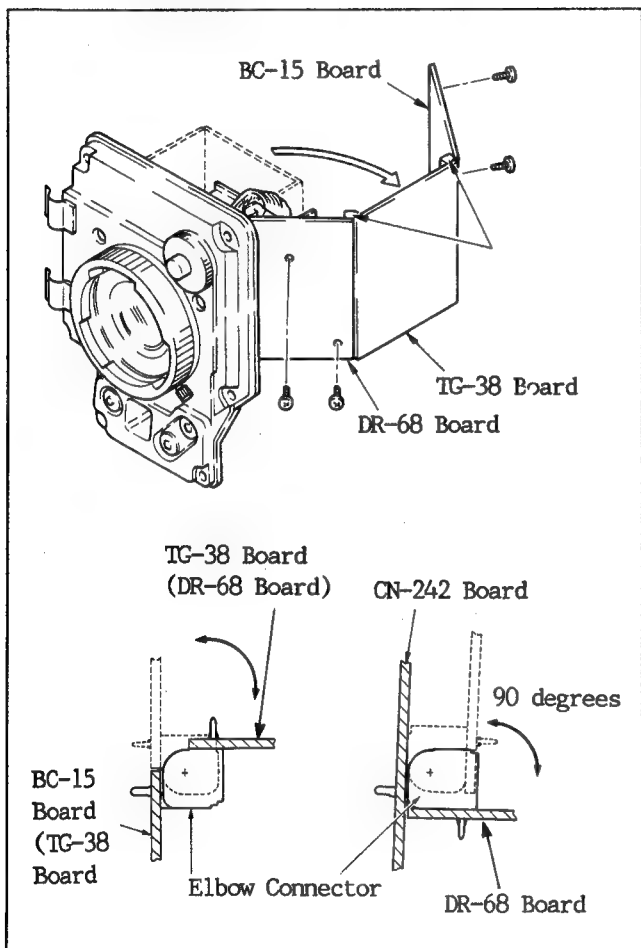
6. Install a new front unit by reversing procedures above.

2-3-2. Replacement of TG-38, DR-68 and CN-242 Boards

1. Remove the front unit, referring to Steps 1 to 5 in Section 2-3-1. "Replacement of Front Unit".
2. Remove the four screws and remove the block shielding cover.



3. Remove the two screws securing the BC-15 board and remove the two screws securing the DR-68 board. Release the three boards BC-15, TG-38 and DR-68 as illustrated. In this case, be sure not to exceed 180 degrees in board angles. Otherwise, connector connecting two boards (elbow connector) may be damaged.



* Two kinds of elbow connector are used between boards.

Front-to-front type connector

BC-15 board ↔ TG-38 board

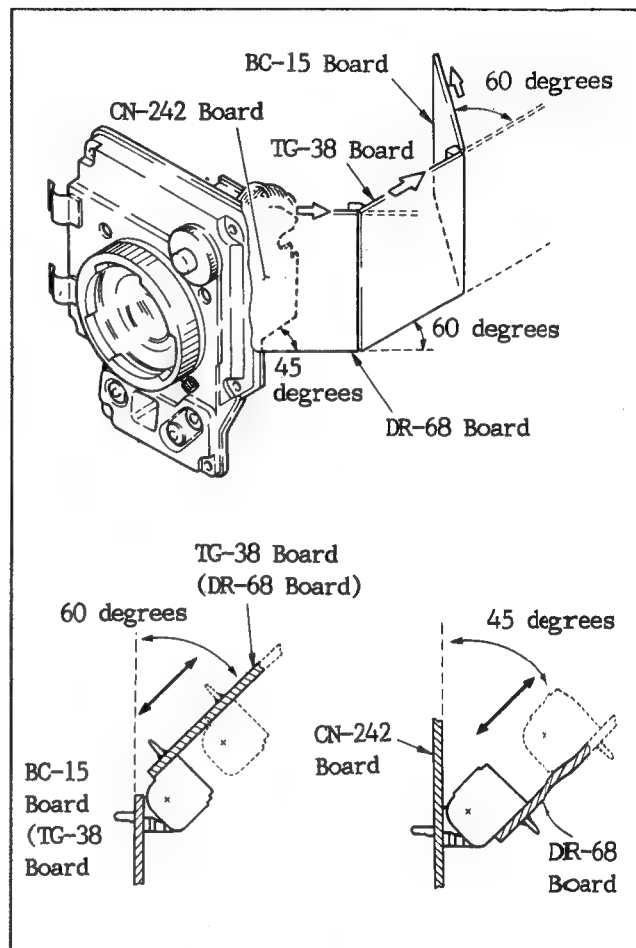
TG-38 board ↔ DR-68 board

Back to front type connector

DR-68 board ↔ CN-242 board

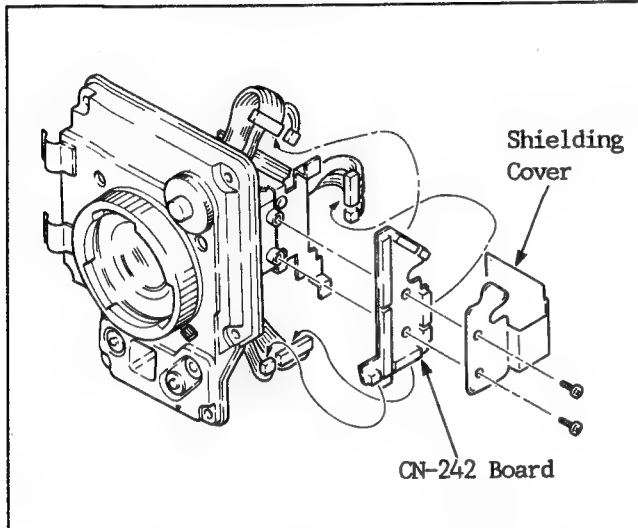
PR-111 board ↔ IE-23 board

4. Remove the TG-38 board on DR-68 board, keeping the board attached angle shown in the figure. When connecting the boards, do in the same way. Otherwise, an elbow connector may be damaged.



5. Replace the TG-38 board on DR-68 board. Assemble the boards by reversing procedures above. If the CN-242 board is to be replaced, perform Step 6 and later.

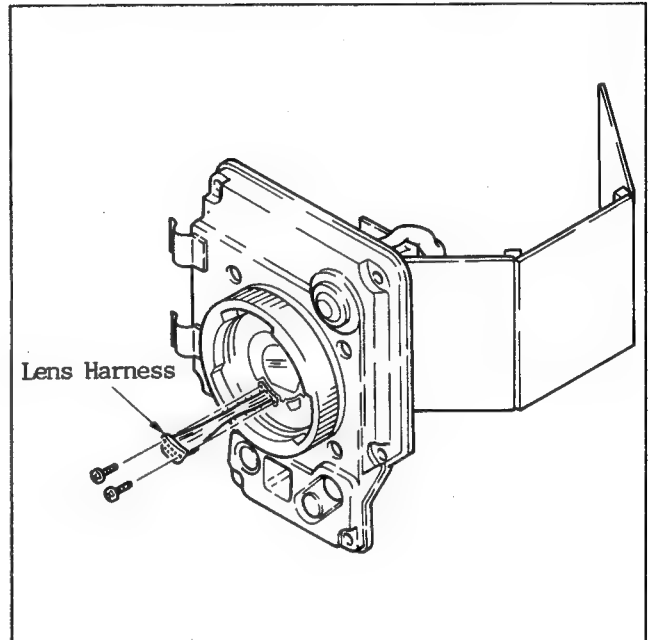
6. Disconnect the six connectors CN3, CN4, CN5, CN6, CN7 and CN8 on the CN-242 board. Remove the two screws and remove the shielding cover and the CN-242 board. The CN-242 board is stuck to the shielding cover with a double-sided adhesive tape.



7. Install a new board and shielding cover and assemble the boards by reversing procedures above.

2-3-3. Replacement of Lens Harness

1. Release the boards as illustrated referring to Steps 1 to 3 in Section 2-3-2.
2. Remove the two screws and draw the lens harness out.



3. Attach a new harness by reversing procedures above.

2-4. CONNECTORS AND CABLES

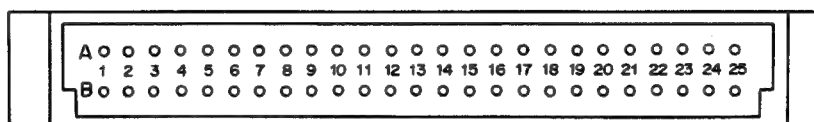
2-4-1. Connector Input/Output Signals

The main connector input/output signals are as follows:

VIDEO OUT; 1.0Vp-p \pm 0.1V, sync negative 75

GEN LOCK ; 1.0Vp-p, sync negative, or black barst

CAMERA/CA (50P)

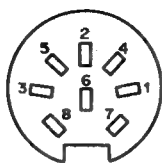


(EXT VIEW)

Pin No.	Signal	Specification
A1	GND (CHASSIS)	-60dBm
B1	GND (CHASSIS)	
A2	MIC OUT (Y)	
B2	MIC OUT (X)	$Z_i \geq 600 \Omega$
A3	MIC OUT (G)	
B3	(SPARE)	
A4	REC TALLY IN	GND: START/STOP
B4	(SPARE)	
A5	(SPARE)	
B5	(SPARE)	$Z_i = 75 \Omega \pm 0.5\%$
A6	(SPARE)	
B6	(SPARE)	
A7	(SPARE)	$4.5 \pm 0.5V$; negative $Z_o \leq 2k\Omega$
B7	(SPARE)	
A8	GEN LOCK VIDEO IN (G)	
B8	GEN LOCK VIDEO IN (X)	$Z_i \geq 10k$
A9	SYNC OUT (G)	
B9	SYNC OUT (X)	
A10	PB RET VIDEO IN (G)	RET VIDEO; GND active
B10	PB RET VIDEO IN (X)	
A11	VF VIDEO CONT IN	
B11	PLAYBACK/CAMERA CONT PB ID IN	$Z_i \geq 10k\Omega$
A12	VBS (CCQ) OUT (G)	1.0Vp-p, negative synch $Z_o = 75 \Omega \pm 0.5\%$
B12	VBS (CCQ) OUT (X)	
A13	(SPARE)	
B13	VIR CCU CONT OUT	Stand by; 0V or OPEN ON; $4.5 \pm 0.5V$ VIR; GND CCU; 4.5V

Pin No.	Signal	Specification
A14	CHROMINANCE OUT (G)	0.286Vp-p
B14	CHROMINANCE OUT (X)	$Z_o = 75\Omega \pm 0.5\%$
A15	LUMINANCE OUT (G)	1.0Vp-p, negative synch.
B15	LUMINANCE OUT (X)	$Z_o = 75\Omega \pm 0.5\%$
A16	PR VIDEO GND OUT	
B16	R PR VIDEO OUT	1.4Vp-p, positive $Z_o \leq 1k\Omega$
A17	G PR VIDEO OUT	
B17	B PR VIDEO OUT	
A18	BATT ALARM S. DATA	
B18	REC VIEW CONT OUT	GND; rec review
A19	(SPARE)	
B19	(SPARE)	
A20	+8.5V OUT	$\pm 0.2V$
B20	+5V OUT	$\pm 0.1V$
A21	-5V OUT	$\pm 0.1V$
B21	GND	REG, GND
A22	UNREG (+12V) IN	
B22	UNREG (+12V) IN	
A23	UNREG (GND) IN	
B23	UNREG (GND) IN	
A24	(SPARE)	
B24	(SPARE)	
A25	GND (CHASSIS)	CHASSIS GND
B25	GND (CHASSIS)	

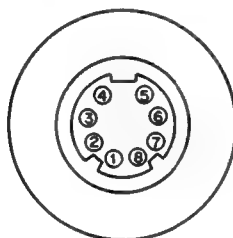
VF (8P, FEMALE)



(WIRING SIDE)

Pin No.	Signal	Specification
1	EXT DC OUT (G)	GND for +12V
2	REC TALLY IND OUT	
3		
4	VF VIDEO OUT (G)	GND for VF VIDEO
5	BATT IND OUT	$Z_i \geq 100\Omega$
6	VF VIDEO OUT (X)	$V = 1V_{p-p}$
7	EXT DC OUT (+12V)	10.5V to 17Vdc 3A
8	GAIN UP IND OUT	+5V $Z_i = 1k\Omega$

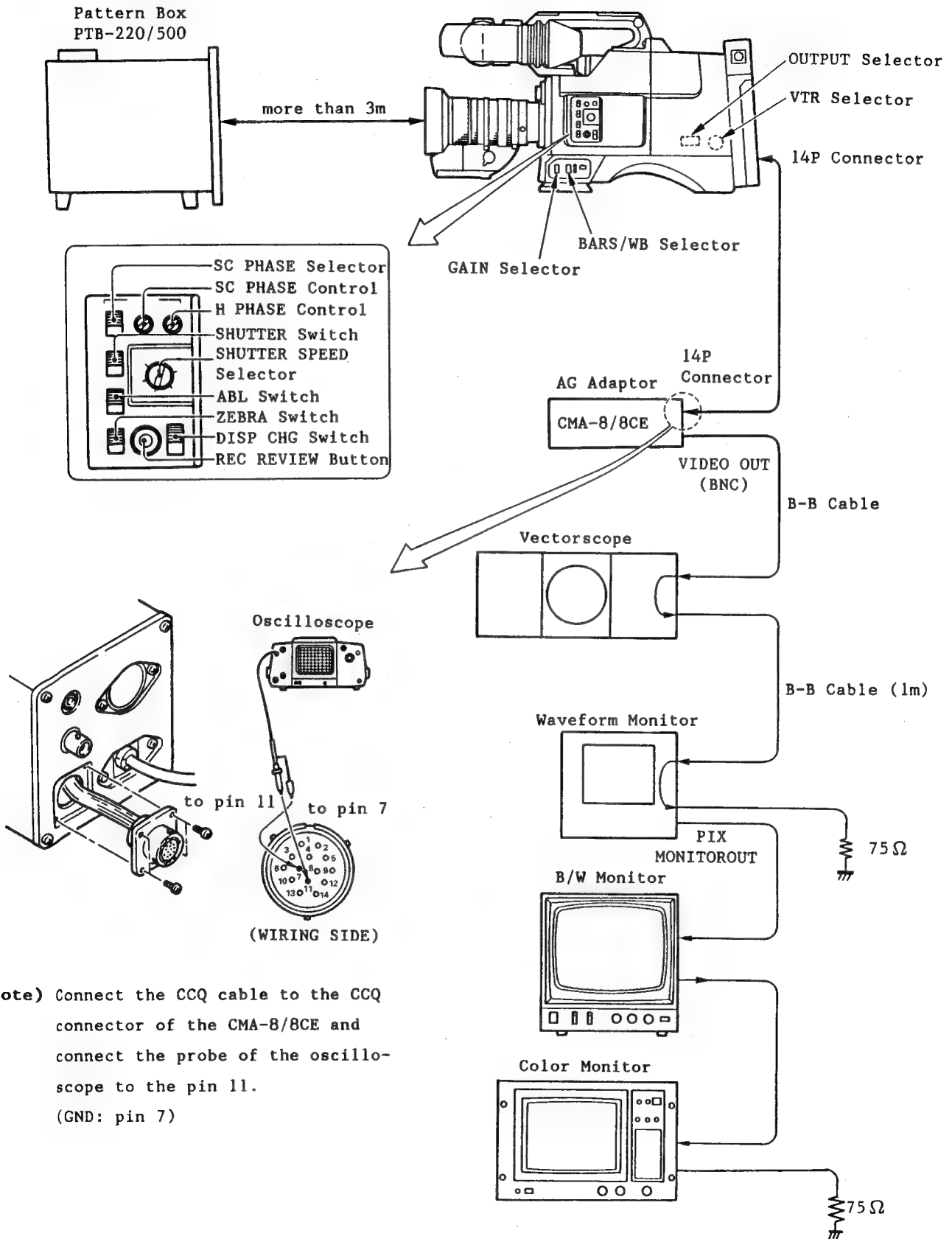
TITLE (8P, FEMALE)



(EXT VIEW)

Pin No.	Signal	Specification
1	SYNC OUT	$+4.3 \pm 0.5V$
2	(SPARE)	
3	CHR KEY VIDEO IN	$+4.2 \pm 0.4V$
4	R CHR VIDEO IN	$+4.2 \pm 0.4V$
5	G CHR VIDEO IN	$+4.2 \pm 0.4V$
6	B CHR VIDEO IN	$+4.2 \pm 0.4V$
7	GND	
8	+5V OUT	$+5 \pm 0.2V$

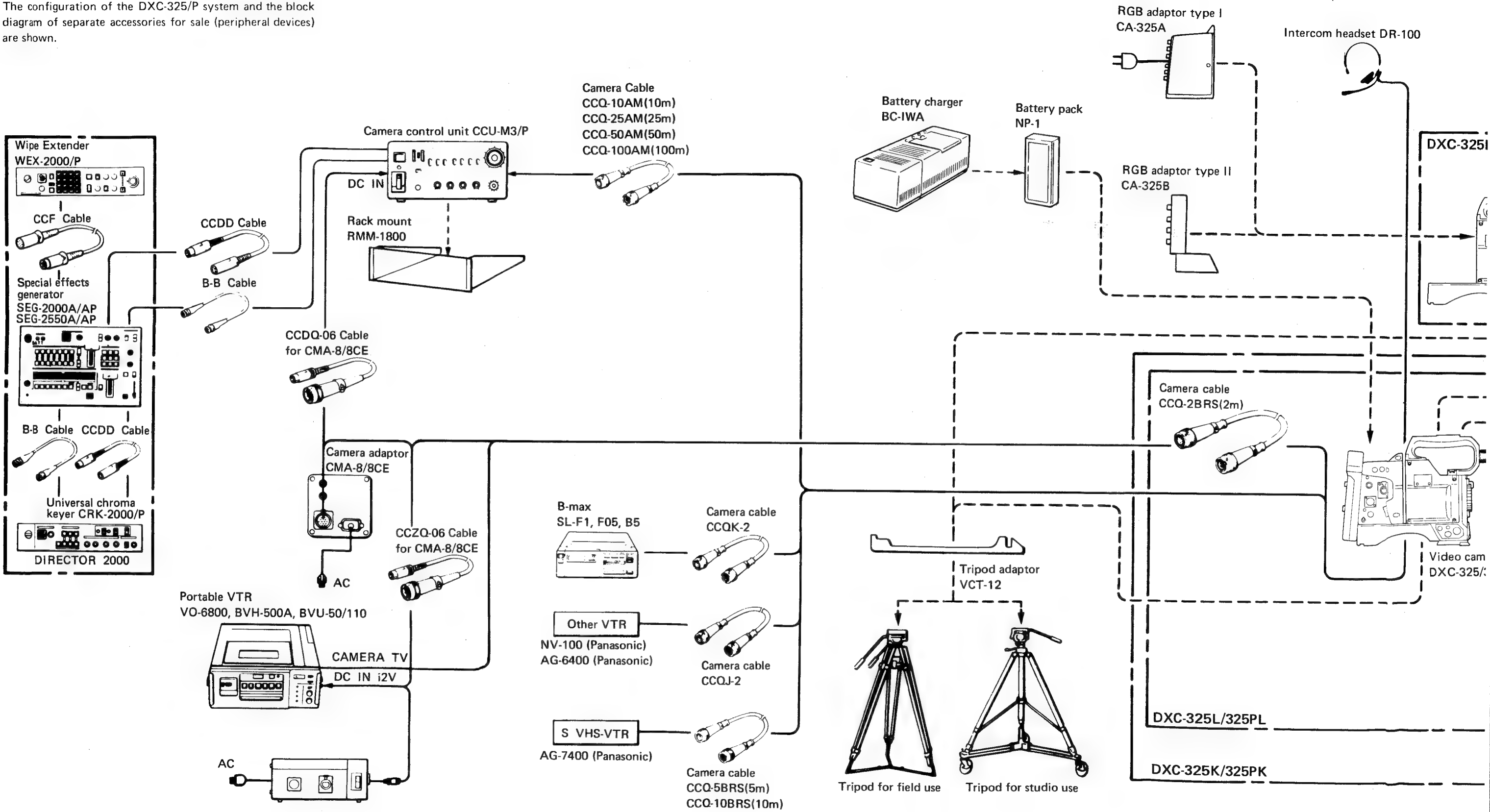
3-1-2. Connections and Initial Setting

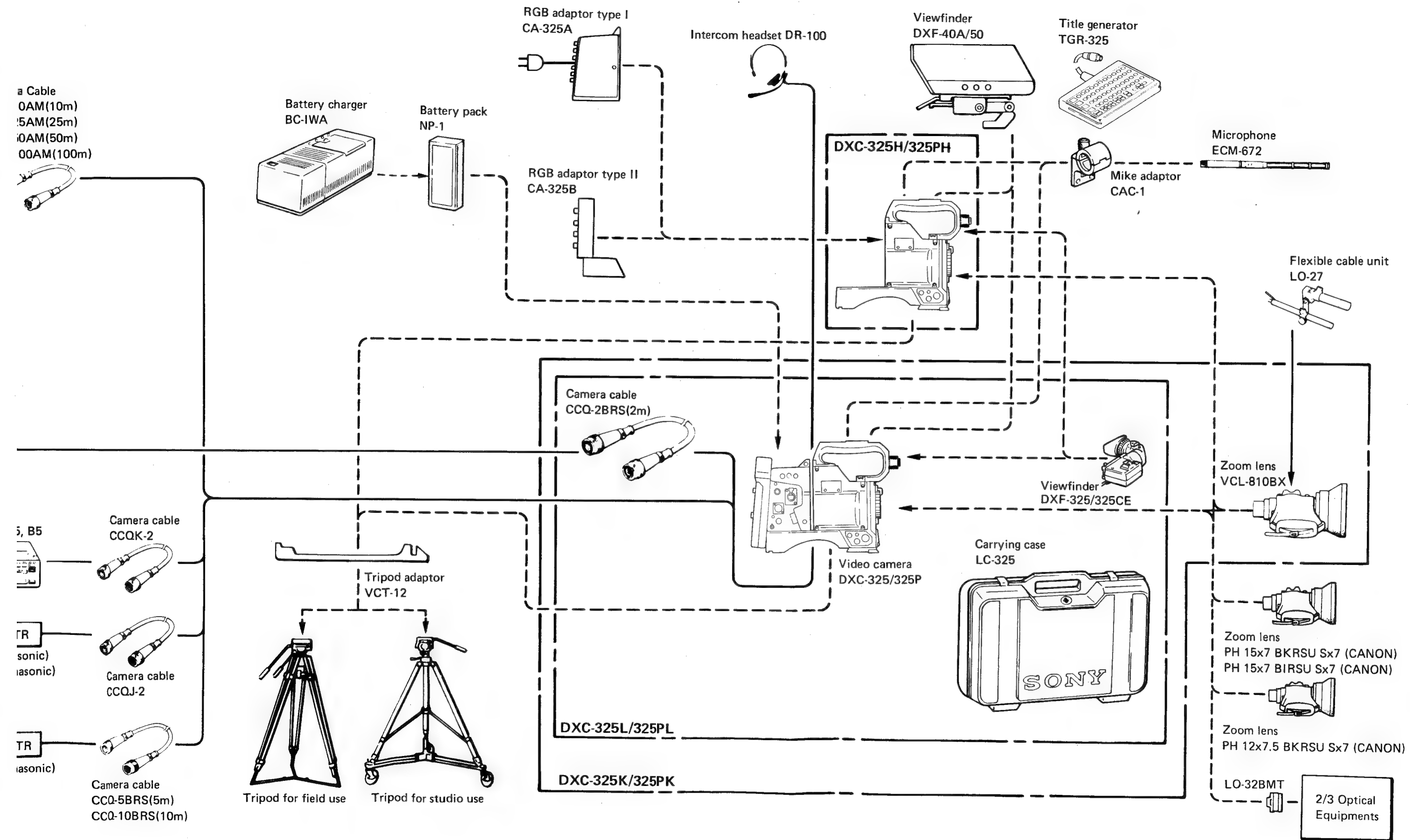


Note) Connect the CCQ cable to the CCQ connector of the CMA-8/8CE and connect the probe of the oscilloscope to the pin 11.
(GND: pin 7)

2-5. SYSTEM BLOCK DIAGRAM

The configuration of the DXC-325/P system and the block diagram of separate accessories for sale (peripheral devices) are shown.





3-1-3. Initial Setting

Set the camera switches and controls as follows.

GAIN switch: 0dB

BARS WB switch: 3200°K

VTR switch: 1

FILTER knob: 1

DXC-325/325P

AT-53 board

S4 (ABL) switch: OFF

S9 (CCU INH/NORMAL) switch: NORMAL

Reset the back-up memory by changing over the S1 (OPE/ADJ) switch as follows.

Step 1. Set the POWER SWITCH to OFF position.

Step 2. Set the S1 switch to ADJ.

Step 3. Set the POWER switch to ON position.

MEMORY NG is then displayed on the viewfinder screen.

Note: During the adjustment, do not touch the following switches.

If the switches are changed over, be sure to reset the back-up memory again.

- . AUTO B/W BALANCE switch

- . S1 (ADJ/OPE) switch

CA-325/325P

SW-285 board

S1 (OUTPUT VBS/YC) selector: VBS

3-2 BEFORE ADJUSTMENT

Note: 1. Before adjustment, connect the equipments referring to 3-1-2. Connection and Initial Setting. And confirm that the following specifications are satisfied.

2. Before adjustment, set the POWER switch to ON and warm up for about 10 minutes.

3-2-1. Color Bar Signal

Equipment: Vectorscope, Waveform monitor

Preparation: Set the BARS WB switch on the side of the camera to BARS.

Specifications:

Y Level $700 \pm 15\text{mV}$

SYNC Level
 $300 \pm 15\text{mV}$

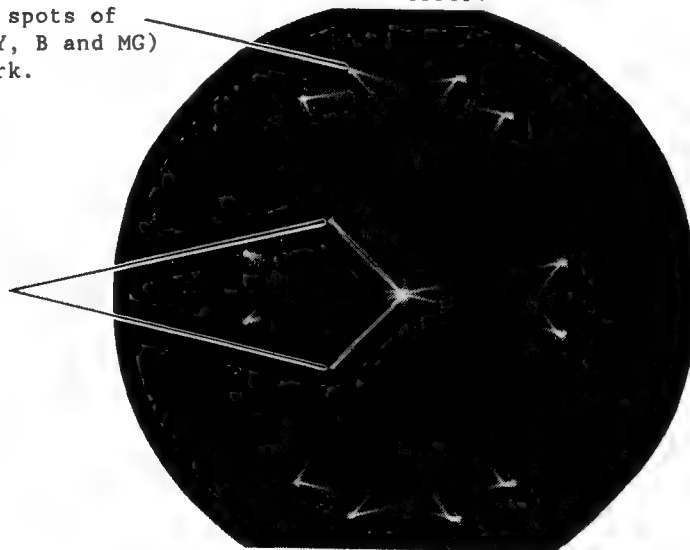


Note: Partial difference between scale and signal level is caused by photographic error.

Chroma Level

- . Adjust so that the beam spots of each color (R, YL, G, CY, B and MG) are inside the "田" mark.

Burst Spot 75%



Note: When the specifications are not satisfied, carry out 3-4 ENCODER SYSTEM (PR-111, ES-1 board) adjustment.

3-2-2. Sensitivity Measurement

Object: White pattern

Lighting: 3200°K, 2000 lux

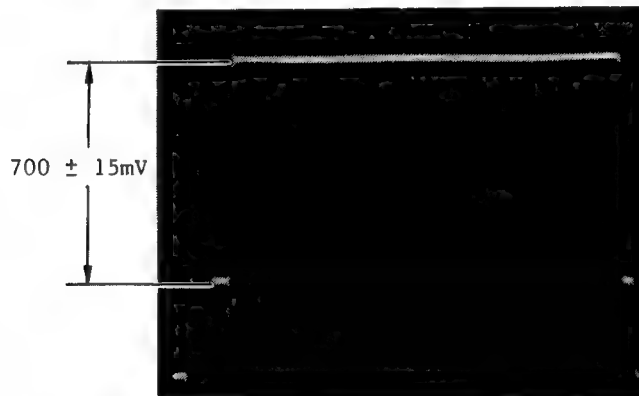
(If the pattern box is used, set the
AUTO mode to "706 Nit")

Preparation:

1. Adjust the zoom control at "TELE" so that the white pattern frame touches the under-scanned picture frame on the screen.
2. Manually set the iris control to F5.0.
3. Set the BARS WB switch on the front of the camera to AUTO.
4. Perform the automatic white balancing.

Equipment: Waveform monitor

Specifications: Adjust so that the white
level of the grayscale
chart is $700 \pm 15\text{mV}$.



Note: When the specification is not satisfied,
perform all adjustments in 3-5. Video
Process System.

3-2-3. Gamma and Gradation Measurement

Object: Grayscale chart

(Sony parts number J-6026-130-A)

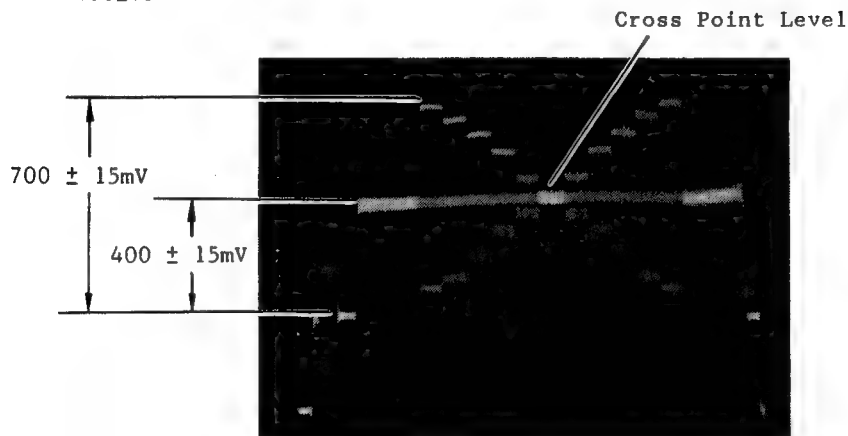
Light: Pattern box PTB-220/500

Equipment: Waveform monitor

Preparation:

1. Set the BARS WB switch on the side of the camera to 3200°K.
2. Adjust the zoom control so that the Grayscale chart frame touches the underscanned picture frame on the monitor.
3. Adjust the iris control so that the white level of Grayscale chart is $700 \pm 15\text{mV}$ on the waveform monitor.

Specification: Adjust so that the cross point level of the grayscale chart is $400 \pm 15\text{mV}$.



Note: Partial difference between signal level and scale is caused by a photographic error.

Note: When the specification is not satisfied, carry out 3-5-5. G ch Gamma Balance and Gamma Set Adjustment.

3-2-4. Resolution Measurement

Object: Resolution chart

(Sony parts number J-6026-100-A)

Light: Pattern box PTB-220/500

Equipment: Waveform monitor

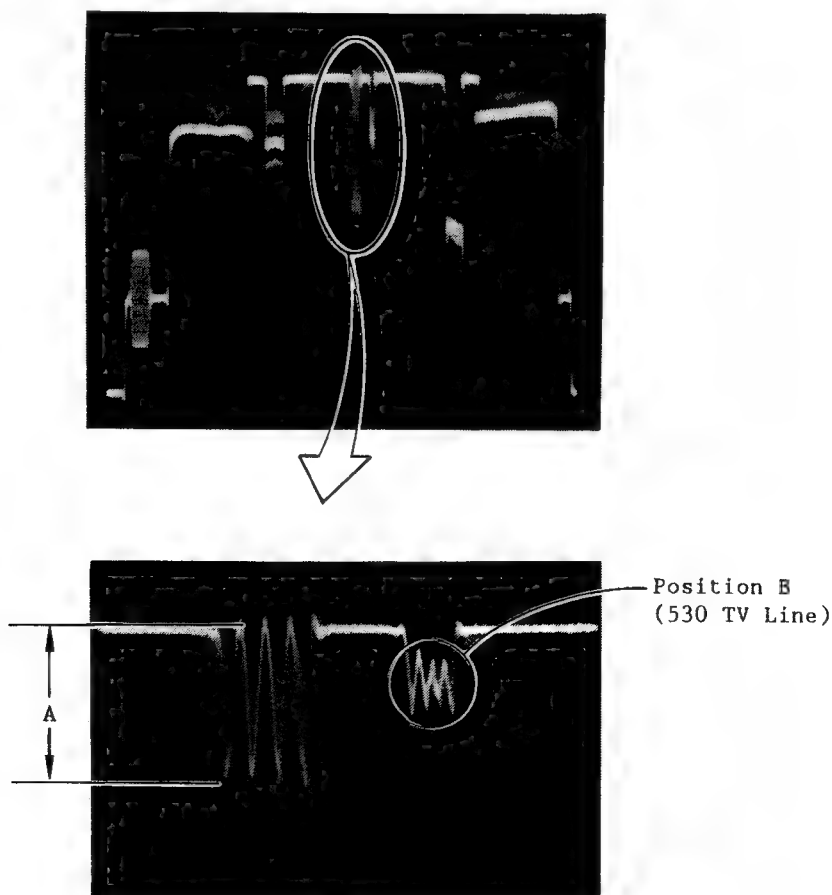
Preparation:

1. Set the BARS WB switch on the side of the camera to 3200 K.
2. Adjust the zoom control so that the resolution chart frame touches the underscanned frame on the monitor.
3. Adjust the iris control so that the white level of the resolution chart is $560 \pm 14\text{mV}$ on the waveform monitor.
4. Adjust the focus control so that the amplitude "A" of the resolution chart is maximized.
5. Set the "LINE SELECTOR" of the waveform monitor to the 530 TV lines of the resolution chart.

Specification: Four negative peaks corresponding to four black stripes must appear at the 530 TV lines, position "B" of the resolution chart on the monitor.

The CCD device has 510 picture elements in the horizontal line. When the vertical black stripes corresponding to 530 TV lines are optically positioned between each element in the CCD, the black stripes do not appear on the monitor. It seems that the resolution has been reduced. In this case, pan the camera slightly so that the best resolution is obtained.

Note: When the specification is not satisfied, perform 3-8. Resolution Adjustment.



3-3. SYNC SIGNAL SYSTEM (ES-1 BOARD)

3-3-1. Sub Carrier Frequency Adjustment

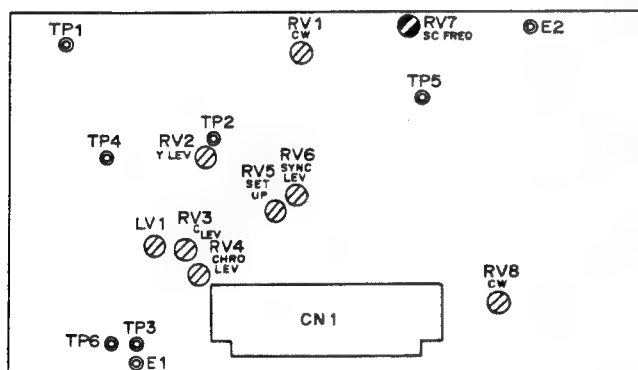
Equipment: Frequency counter

To be extended: ES-1 board

Test point: TP5 (GND: E1) ES-1 board

Adjustment point: RV7 ES-1 board

Specification: 4,433,618Hz \pm 30Hz



ES-1 BOARD (COMPONENT SIDE)



ES-1 BOARD (PANEL SIDE)

3-4. ENCODER SYSTEM (PR-111, ES-1 BOARD)

3-4-1. BARS Level Adjustment

Equipment: Oscilloscope

To be extended: PR-111 board

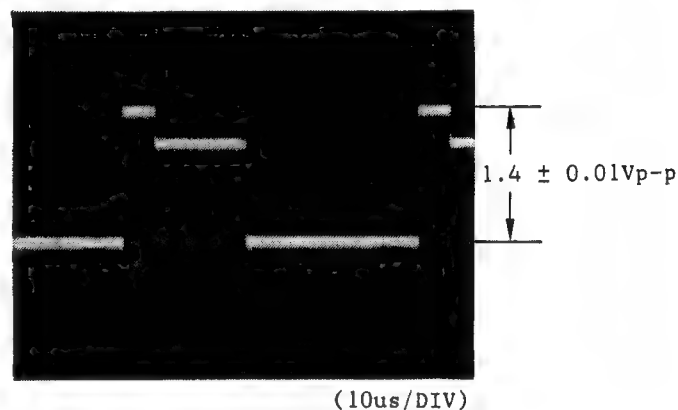
Preparation: Set the BARS WB switch on the side of the camera to BARS.

Test point: TP9/PR-111 board

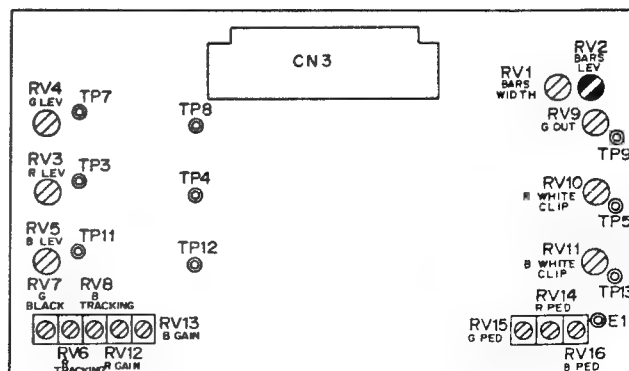
Trigger: HD (B21 on the extension board)

Adjustment point: RV2/PR-111 board

Specification: 1.4 \pm 0.01Vp-p



(10us/DIV)



PR-111 BOARD (COMPONENT SIDE)

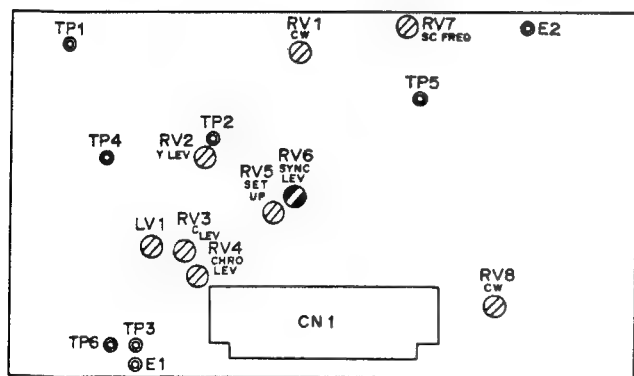
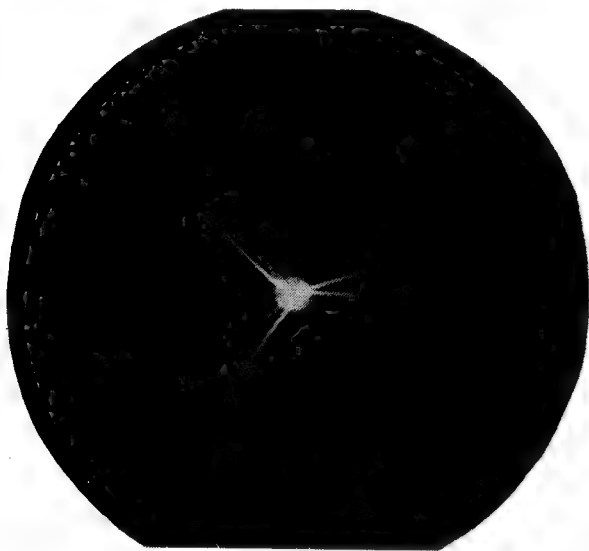
3-4-2. Carrier Balance Adjustment

Equipment: Vectorscope (MAX GAIN)

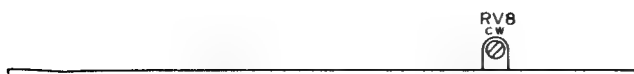
To be extended: ES-1 board

Preparation: Set the BARS WB switch on the side of the camera to BARS.

Adjustment: Adjust RV1 and RV2/CM-22 board so that the white beam spot is in the center of the vectorscope.



ES-1 BOARD (COMPONENT SIDE)



ES-1 BOARD (PANEL SIDE)

3-4-3. Y and SYNC Level Adjustment

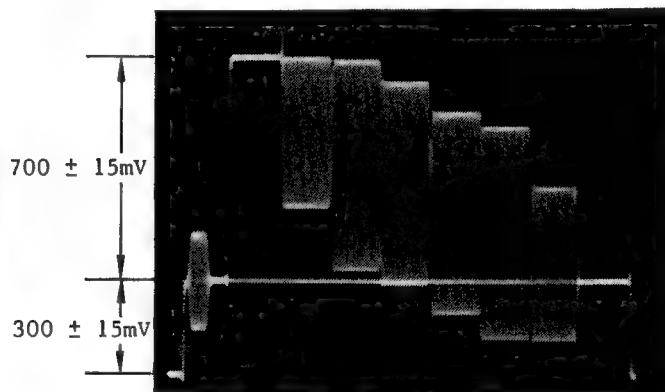
Equipment: Waveform monitor

To be extended: ES-1 board

Preparation: Set the BARS WB switch on the side of the camera to BARS.

Adjustment:

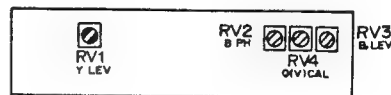
1. Adjust RV6/ES-1 board so that the SYNC level of the color bars signal is $300 \pm 15\text{mV}$.
2. Adjust RV1/MX-18 board so that the Y level of the color bars signal is $700 \pm 15\text{mV}$.



3. Repeat steps 1 to 3 several times until the specifications are satisfied.



CM-22 BOARD



MX-18 BOARD

3-4-4. Color Vector Adjustment

Equipment: Vectorscope

To be extended: ES-1 board

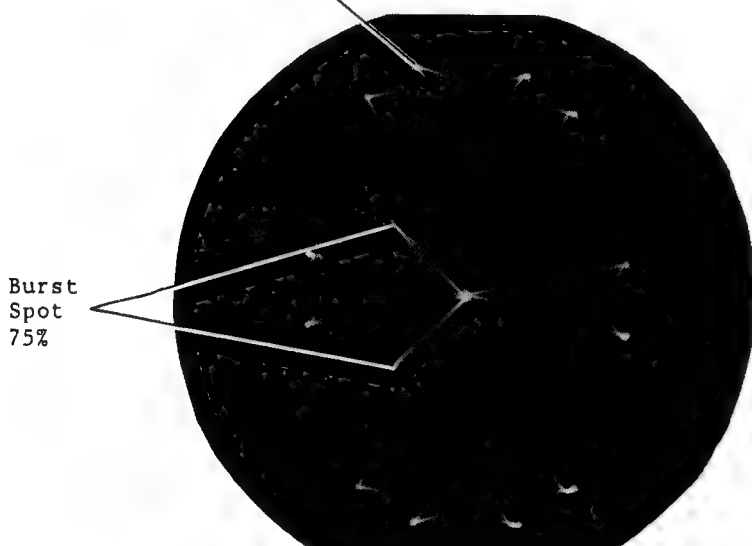
Preparation: Set the GAIN switch on the vectorscope to 75%.

Adjust "PHASE" control on the vectorscope so that the burst spot is set to the 75% axis. Set the BARS WB switch on the side of camera to BARS.

Adjustment:

1. Adjust RV3/MX-18 board so that the burst level is set to the 75% position.
2. Adjust RV2/MX-18 board and PHASE control on the vectorscope so that the burst spot is located on the burst graticule line.
3. Adjust RV4/MX-18 board and RV3, LV1/ES-1 board so that the beam spots of each color are inside the "E" mark.
4. Repeat Step 1 through step 4 several times.

Adjust so that the beam spots of each color (R, YL, G, CY, B and MG) are inside the "E" mark.



3-4-5. Zebra Adjustment

Equipment: Viewfinder

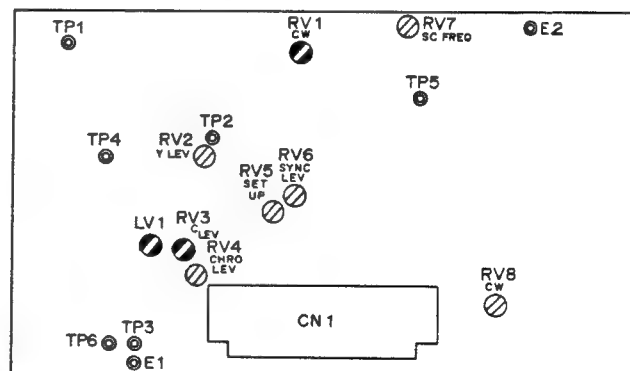
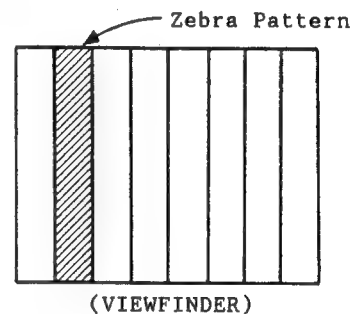
To be extended: ES-1 board

Preparation: Set the BARS WB switch on the side of the camera to BARS.

Set the S5 (ZEBRA ON/OFF) switch on the AT-53 board to ON.

Adjustment:

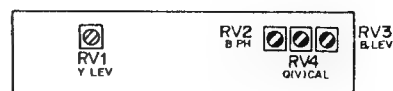
Adjust RV1/ES-1 board so that a zebra pattern appears at the yellow portion (500±10mV) of color bar.



ES-1 BOARD (COMPONENT SIDE)



ES-1 BOARD (PANEL SIDE)



MX-18 BOARD

3-4-6. Color Bar Size Adjustment

Equipment: Oscilloscope

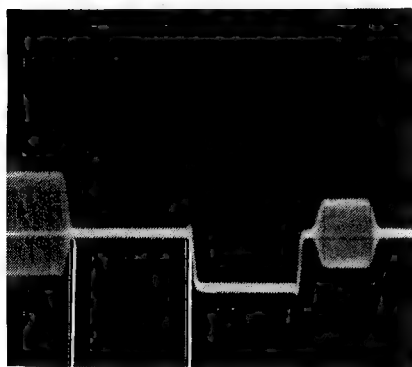
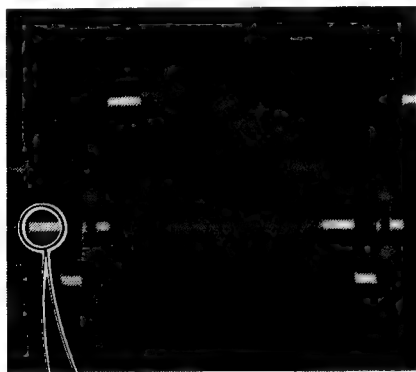
To be extended: PR-111 board

Preparation: Set the BARS WB switch on the side of the camera to BARS.

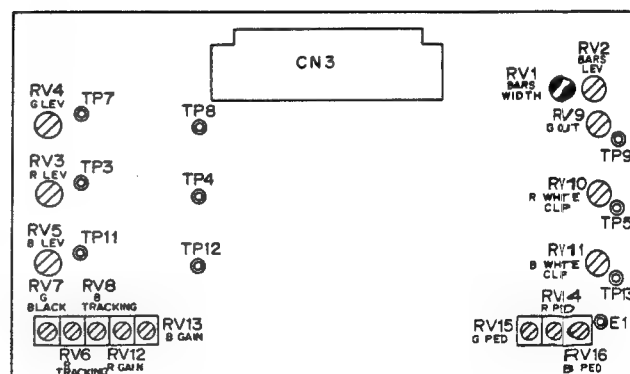
Test point: VIDEO OUT (BNC)

Trigger: HD (A21/extension board)

Adjustment: Adjust RV1/PR-111 board so that the black level width of the color bars signal is $5.3 \pm 0.2 \mu\text{s}$.



$5.3 \pm 0.2 \mu\text{s}$



PR-111 BOARD (COMPONENT SIDE)

3-4-7. S-VHS VTR-Y Level Adjustment

Note: Before this adjustment, carry out 3-4-4.
Color Vector Adjustment.

Equipment: Waveform monitor

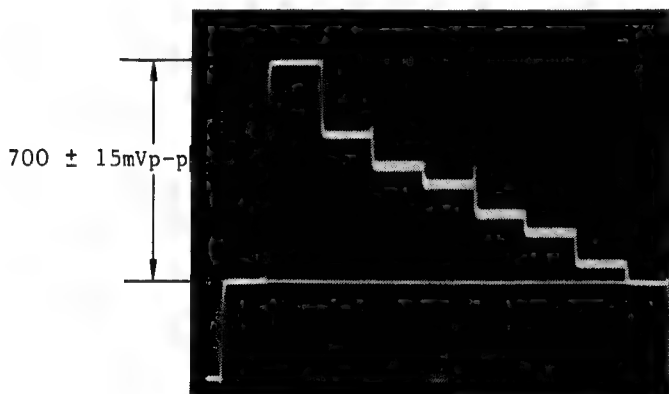
To be extended: ES-1 board

Preparation: Set the BARS WB switch on the
side of camera to BARS.

Set the S1 (VBS/YC) switch on the
CA-325/SW-285 board to YC.

Adjustment:

Adjust \odot RV2/ES-1 board so that the white level
of Y signal at waveform monitor is $700 \pm 10\text{mV}$.



3-4-8. S-VHS VTR-Chroma Level Adjustment

Note: Before this adjustment, carry out 3-4-4.
Color Vector Adjustment.

Equipment: Oscilloscope

To be extended: ES-1 board

Preparation: Set the BARS WB switch on the
side of the camera to BARS.

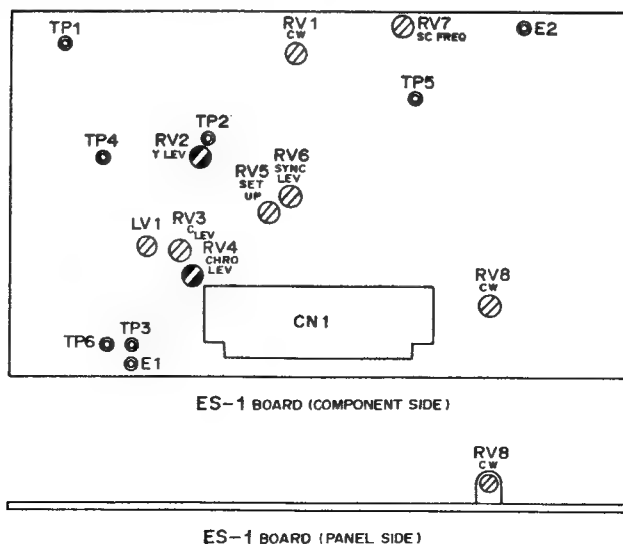
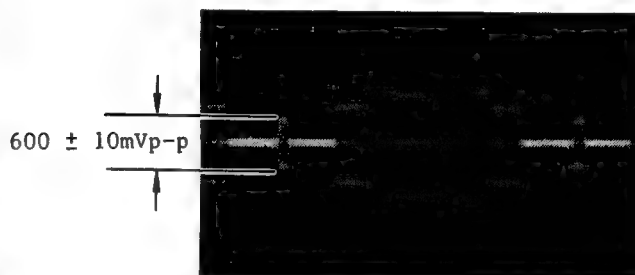
Set the S1 (VBS/YC) switch on the
CA-325/SW-285 board to YC.

Test point: CA-325/CA-13 board

CN2-4 pin

Adjustment:

Adjust \odot RV4/ES-1 board so that the burst level
in the chroma signal is $600 \pm 10\text{mVp-p}$.



3-5. VIDEO PROCESS SYSTEM (PR-111 BOARD)

3-5-1. G ch Video Level Adjustment

Object: White pattern

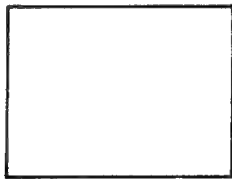
Equipment: Oscilloscope

Preparation: Set the BARS WB switch on the side of the camera to 3200°K.

Trigger: VD (A23/extension board)

Adjustment:

1. Adjust the zoom control so that the white pattern frame touches the underscanned picture frame on the screen.

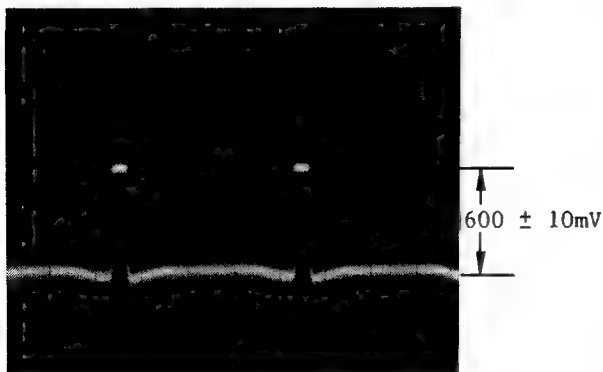


Monitor Screen

2. Lens iris $\rightarrow F \approx 5.0$

3. Adjust \odot RV4/PR-111 board so that the video level at TP8/PR-111 board is $600 \pm 10\text{mV}$.

Note: When the iris control is set from 5.0 to open, confirm the brightness of the pattern box.



Note: Carry out this adjustment through 3-5-3. R ch Video Level Adjustment keeping the iris control set to about F5.0.

3-5-2. B ch Video Level and Pre-gain Adjustment

Note: Be sure to carry out 3-5-1. G ch Video Level Adjustment before this adjustment.

Object: White pattern

Equipment: Oscilloscope

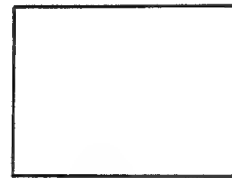
To be extended: PR-111 board

Preparation: Set the BARS WB switch on the side of the camera to 3200°K.

Trigger: VD (A23/extension board)

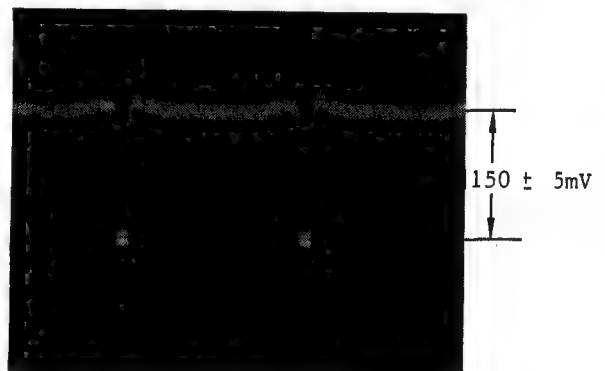
Adjustment:

1. Adjust the zoom control so that the white pattern frame touches the underscanned picture frame on the monitor.

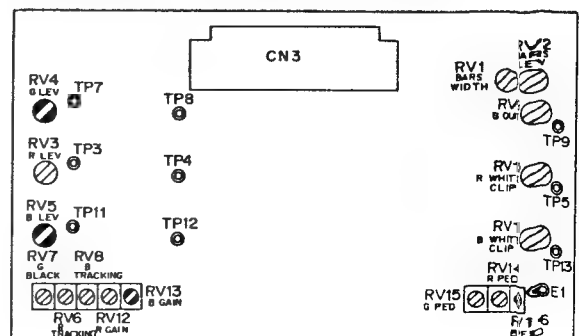


Monitor Screen

2. Adjust \odot RV5/PR-111 board so that the video level at TP11 on the PR-111 board is $150\text{mV} \pm 5\text{mV}$.



3. Adjust \odot RV13 on the PR-111 board so that video level at TP12 on the PR-111 board is $600 \pm 10\text{mV}$.



PR-111 BOARD (COMPONENT SIDE)

3-5-3. R ch Video Level and Pre-gain Adjustment

Note: Be sure to carry out 3-5-2. B ch Level Adjustment before this adjustment.

Object: White pattern

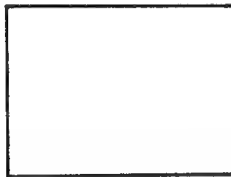
Equipment: Oscilloscope

Preparation: Set the BARS WB switch on the side of the camera to 3200°K.

Trigger: VD (A23/extension board)

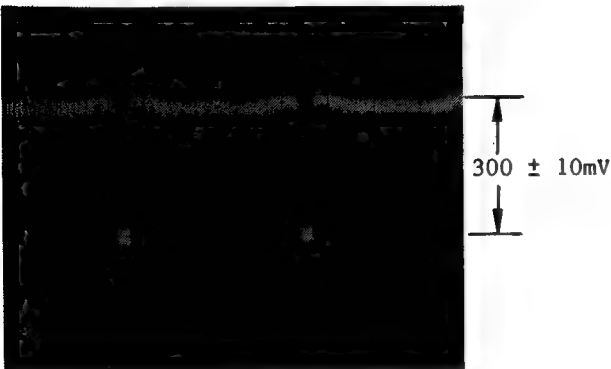
Adjustment:

1. Adjust the zoom control so that the white pattern frame touches the underscanned picture frame on the screen.

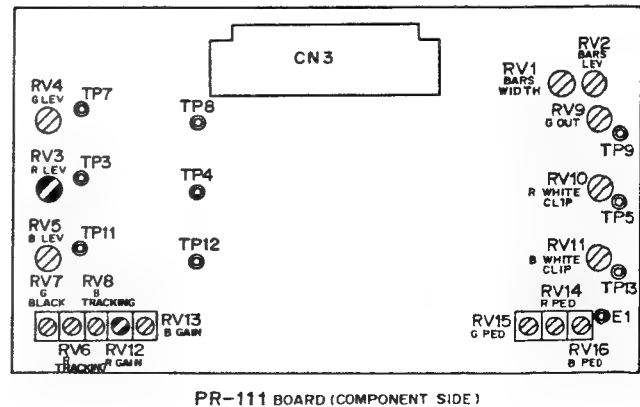
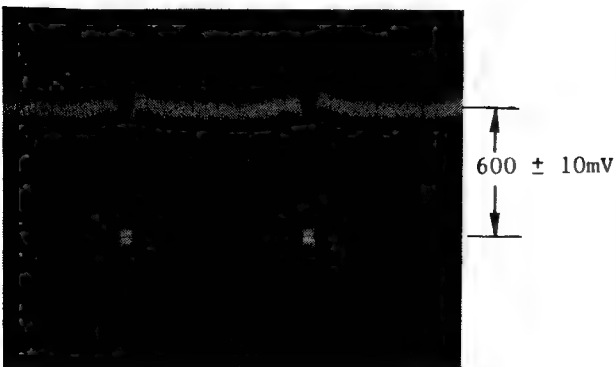


Monitor Screen

2. Adjust RV3/PR-111 board so that the video level at TP3/PR-111 board is $300\text{mV} \pm 10\text{mV}$.



3. Adjust RV12/PR-111 board so that the video level at TP4/PR-111 board is $600\text{mV} \pm 10\text{mV}$.



3-5-4. Black Set and Pedestal Adjustments

Lens iris: Close "C"

Equipment: Oscilloscope, Vectorscope
(MAX GAIN)

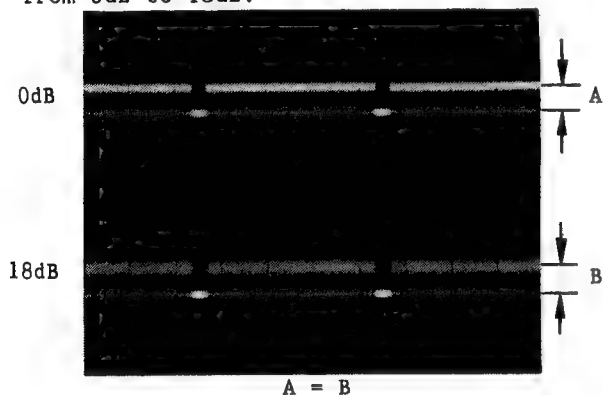
To be extended: PR-111 board

Test point: TP9 (GND: E1) PR-111 board (Connect a 10Kohm resistor between the oscilloscope probe and TP9)

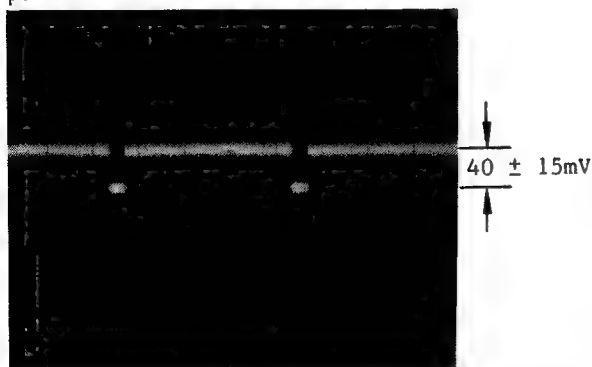
Trigger: VD (A23/extension board)

Adjustment:

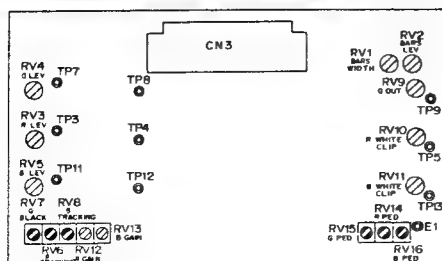
1. Adjust RV7/PR-111 board so that pedestal level does not change when the GAIN switch on the side of the camera is switched over from 0dB to 18dB.



2. Set the GAIN switch on the side of the camera to 0dB.
3. Adjust RV15/PR-111 board so that the pedestal level is $40 \pm 5\text{mV}$.



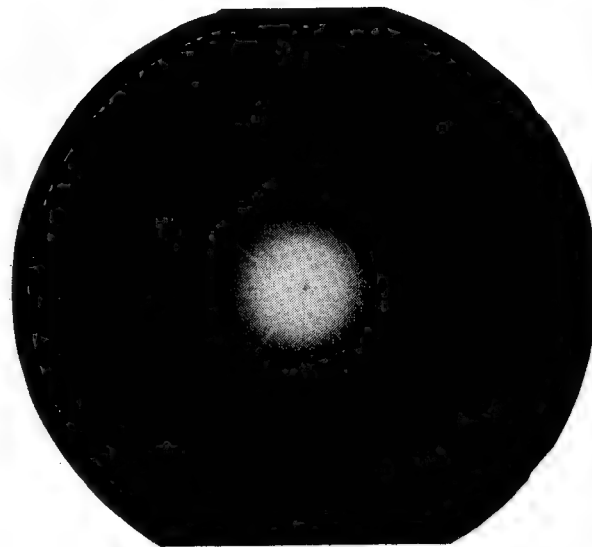
PR-111 BOARD
(COMPONENT SIDE)



DXC-325P (EK)

4. Set the GAIN switch on the side of the camera to 18dB.

5. Adjust RV6 RV8 on the PR-111 board so that the beam spot is in the center of the vectorscope.



6. Set the GAIN switch on the side of the camera to 0dB.

7. Adjust RV14 and RV16/PR-111 board so that the beam spot is in the center of vectorscope.



8. Repeat step 4 through step 7 several times.

9. Set the GAIN switch on the side of the camera to 0dB.

3-5-5. G ch Gamma Balance and Gamma Set Adjustment

Object: Grayscale chart

Equipment: Oscilloscope

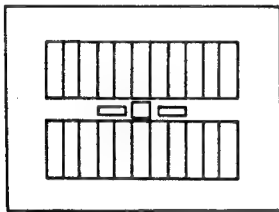
To be extended: PR-111 board

Test point: TP9 (GND: E1)/PR-111 board

Trigger: HD (A21/extension board)

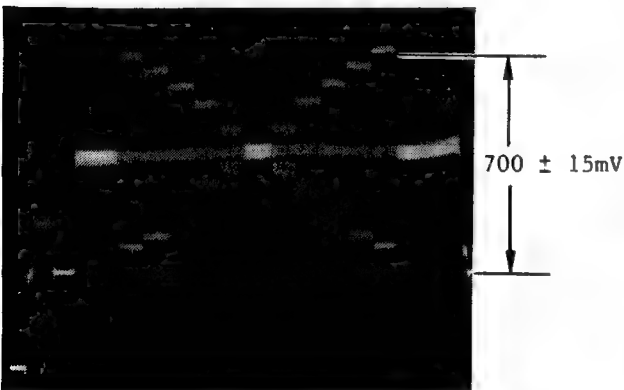
Adjustment:

1. Adjust the zoom control so that the grayscale chart frame touches the underscanned picture frame on the monitor.



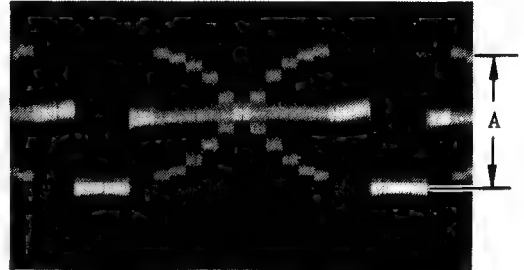
Monitor Screen

2. Adjust the iris control so that the video level is $700 \pm 15\text{mV}$ on the waveform monitor (F ≈ 5.0).

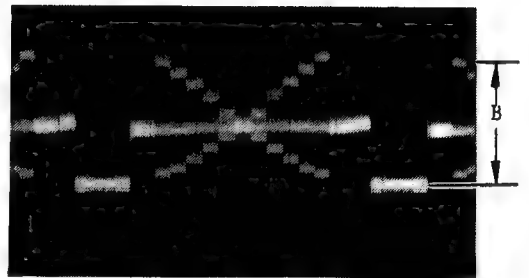


3. Adjust RV1/PR-109G board so that the white level of the video signal does not change when RV2/PR-109G board is turned either fully counterclockwise or fully clockwise.

RV2 fully clockwise

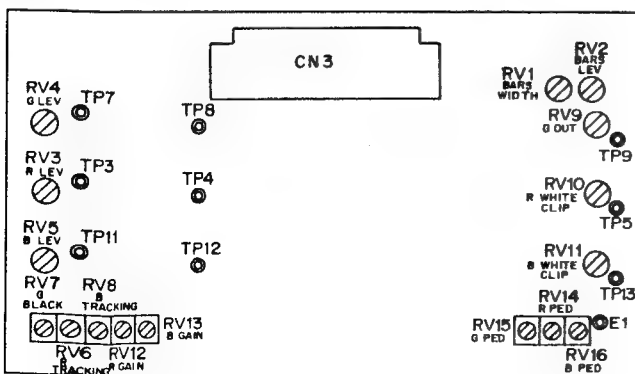


RV2 fully counterclockwise

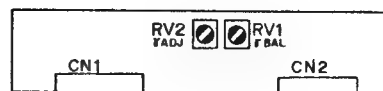


$$A = B$$

4. Adjust RV2/PR-109G board so that the crosspoint level of the video signal is $810 \pm 10\text{mV}$.



PR-111 BOARD (COMPONENT SIDE)



PR-109 BOARD

3-5-6. R ch Gamma Balance Adjustment

Object: Grayscale chart

Equipment: Oscilloscope

To be extended: PR-111 board

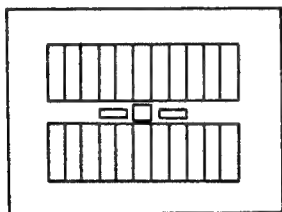
Preparation: Set the BARS WB switch on the side of the camera to 3200°K.

Test point: TP5 (GND: E1)/PR-111 board

Trigger: HD (A21/extension board)

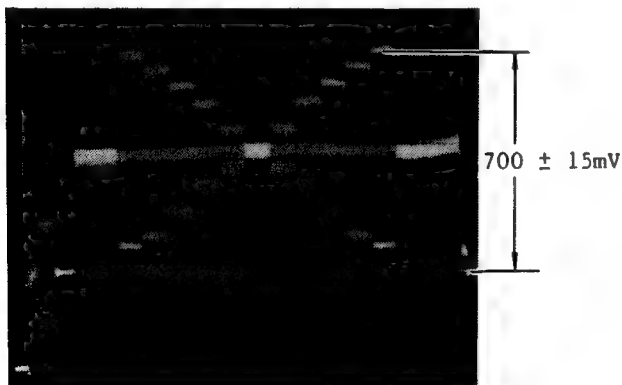
Adjustment:

1. Adjust the zoom control so that the grayscale chart frame touches the underscanned picture frame on the monitor.



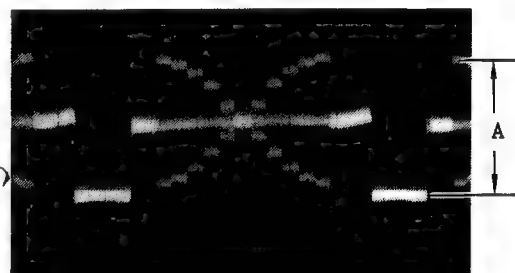
Monitor Screen

2. Adjust the lens iris control so that the white level is $700 \pm 15\text{mV}$ on the waveform monitor ($F \approx 5.0$)

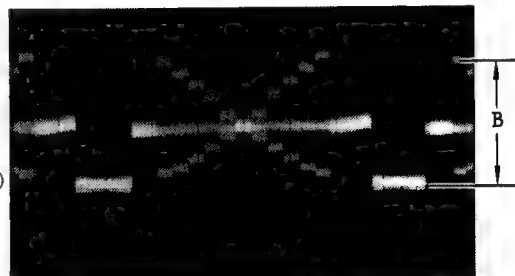


3. Adjust $\odot\text{RV1}$ /PR-109R board so that the white level of the video signal at TP5/PR-111 board does not change when $\odot\text{RV2}$ /PR-109R board is turned either fully counterclockwise or fully clockwise.

$\odot\text{RV2}$
fully
clock wise \odot



$\odot\text{RV2}$
fully
conter-
clockwise \odot



$$A = B$$

3-5-7. B ch Gamma Balance Adjustment

Object: Grayscale chart

Equipment: Oscilloscope

To be extended: PR-111 board

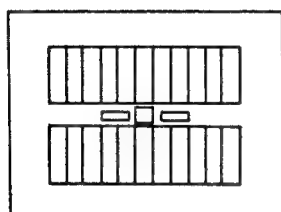
Preparation: Set the BARS WB switch on the side of the camera to 3200°K.

Test point: TP11 (GND: E1)/PR-111 board

Trigger: HD(A21/extension board)

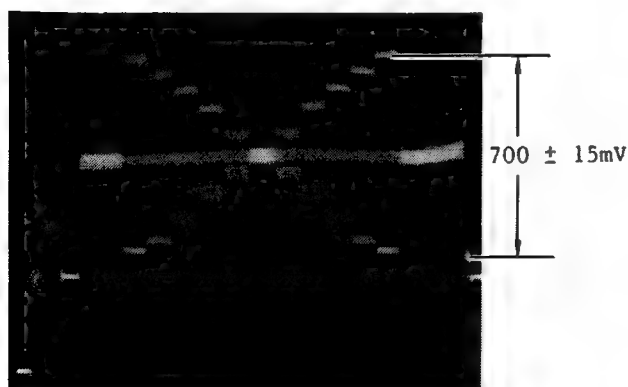
Adjustment:

1. Adjust the zoom control so that the grayscale chart frame touches the underscanned picture frame on the monitor.



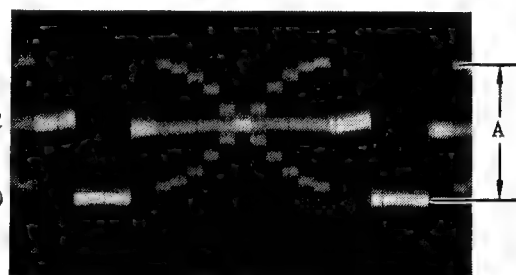
Monitor Screen

2. Adjust the iris control so that the video level is $700 \pm 15\text{mV}$ on the waveform monitor (F = 5.0).

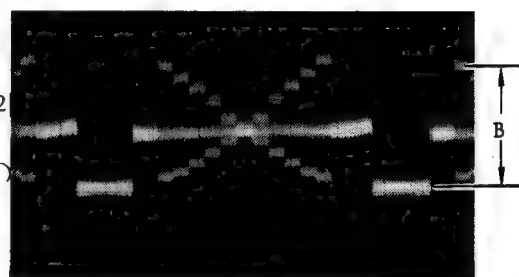


3. Adjust RV1/PR-109B board so that the white level of the video signal at TP11/PR-111 board does not change when RV2/PR-109B board is turned either fully counterclockwise or fully clockwise.

RV2
fully
clock
wise



RV2
fully
conter-
clockwise



3-5-8. R/B ch Gamma Set and Preset Adjustment

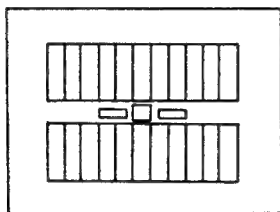
Object: Grayscale chart

Equipment: Waveform monitor, Vectorscope (MAX GAIN)

To be extended: PR-111 board

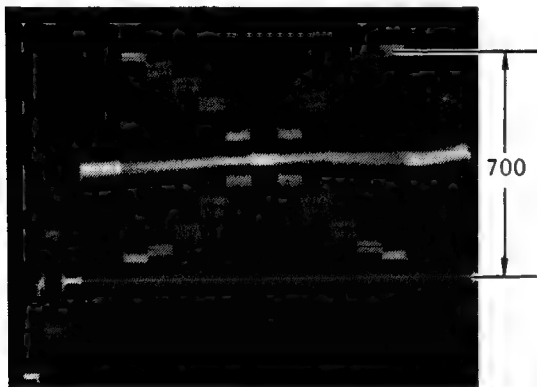
Adjustment:

1. Adjust the zoom control so that the grayscale chart frame touches the underscanned picture frame on the monitor.



Monitor Screen

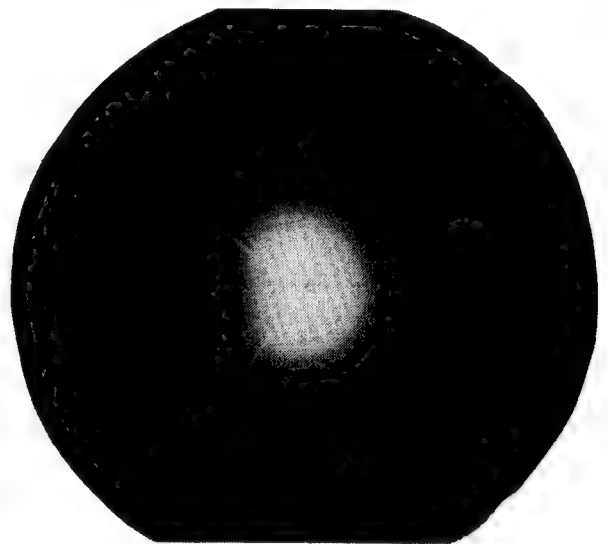
2. Adjust the iris control so that the video level is $700 \pm 15\text{mV}$ on the waveform monitor ($F \approx 5.0$).



$700 \pm 15\text{mV}$

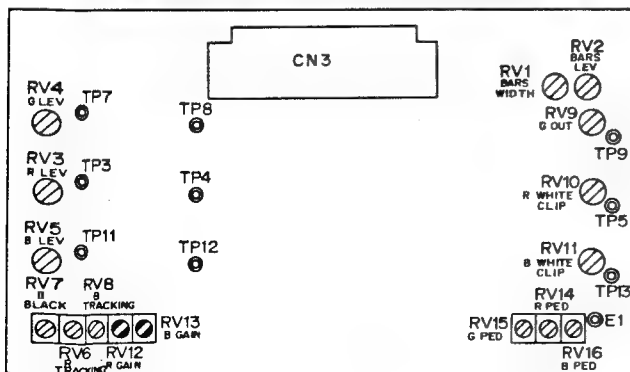
3. RV12 (R GAIN)/PR-111 board
RV13 (B GAIN)/PR-111 board
RV2 (R γ ADJ)/PR-109R board
RV2 (B γ ADJ)/PR-109B board

Alternately adjust the above four controls several times so that the beam spot is in the center of vectorscope.



4. After the adjustment, the following specifications must be satisfied.

If not, perform from 3-5-1. B ch Video Level Adjustment once more.

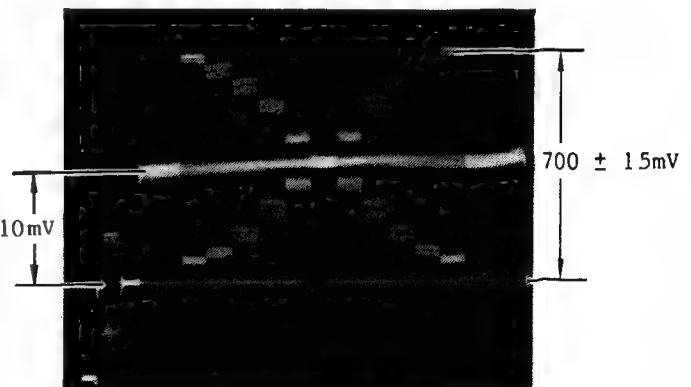


PR-111 BOARD (COMPONENT SIDE)



PR-109 BOARD

$400 \pm 10\text{mV}$



$700 \pm 15\text{mV}$

3-5-9. White Clip Adjustment

Object: Grayscale chart

Equipment: Waveform monitor

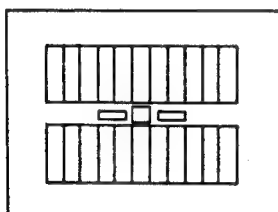
To be extended: PR-111 board

Preparation: Set the BARS WB switch on the side of the camera to 3200°K.

Set the GAIN switch to 0dB.

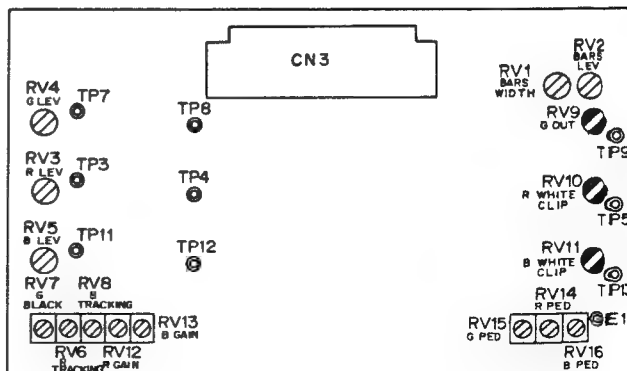
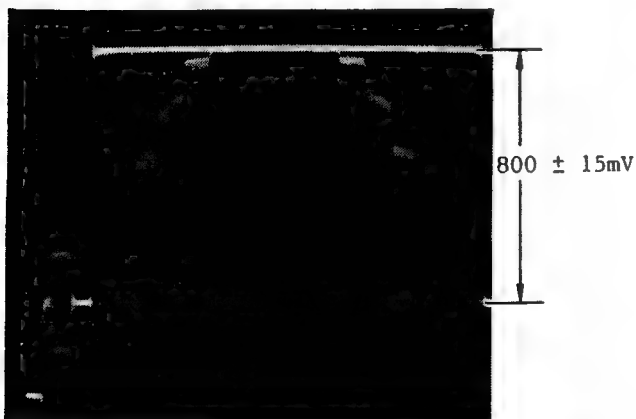
Adjustment:

1. Adjust the zoom control so that the grayscale chart frame touches the underscanned picture frame on the monitor.



Monitor Screen

2. Set the iris control to OPEN.
3. Adjust RV9/PR-111 board so that the white peak level is $800 \pm 15\text{mV}$ on the waveform monitor.
4. Adjust RV10 and RV11/PR-111 board several times so that the carrier leakage of the white peak level is minimized.



PR-111 BOARD (COMPONENT SIDE)

3-6. IMAGE ENHANCER SYSTEM ADJUSTMENT

Note: It is necessary to adjust RV1, RV4 unless these controls are replaced. Do no touch these controls.

3-6-1. CCD BIAS Adjustment

Object: Grayscale chart

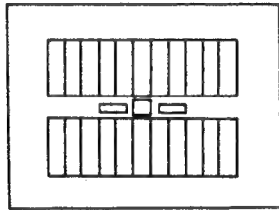
Equipment: Waveform monitor

Preparation: Set the BARS WB switch on the side of the camera to 3200°K.

Test point: TP1/IE-23 board

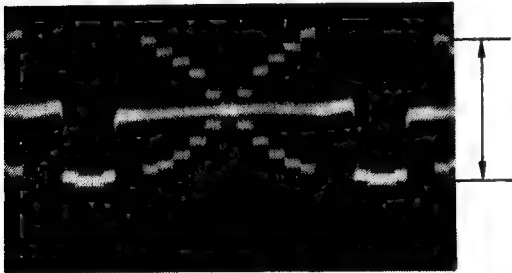
Adjustment:

1. Adjust the zoom control so that the gray-scale chart frame touches the underscanned picture frame on the monitor.



Monitor Screen

2. Adjust RV1/IE-23 board to maximize the waveform amplitude. At that time, the top and bottom of waveform should be not limited at peaks.



3-6-2. IH GAIN Adjustment

Object: Grayscale chart

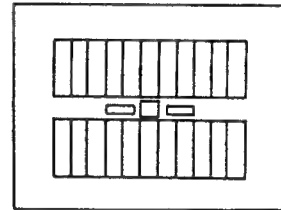
Equipment: Waveform monitor

Preparation: Set the BARS WB switch on the side of the camera to 3200°K.

Adjustment point: RV2/IE-23 board

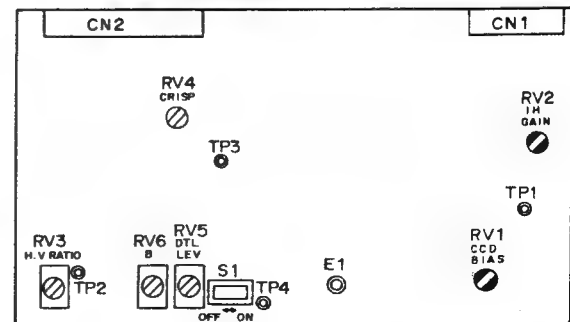
Adjustment:

1. Adjust the zoom control so that the gray-scale chart frame touches the underscanned picture frame on the monitor.



Monitor Screen

2. Adjust RV2/IE-23 board so that video out level does not change when charging over the S1 (DTL)/IE-23 board to ON or OFF.



IE-23 BOARD (COMPONENT SIDE)



IE-23 BOARD (PANEL SIDE)

3-6-3. Crispening Adjustment

Object: Registration chart

Equipment: Oscilloscope

To be extended: IE-23 board

Preparation: Set the BARS WB switch on the side of the camera to 3200°K.

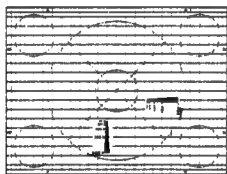
Rotate \odot RV3 (H.V. RATIO)/IE-23 board fully counterclockwise.

Test point: TP4 (GND: E1)/IE-23 board

Trigger: HD (A21/extension board)

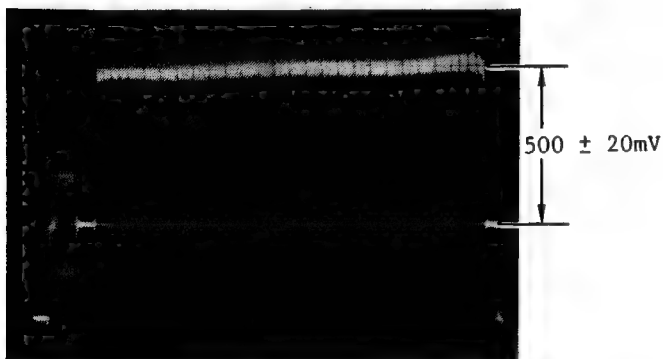
Adjustment:

1. Adjust the zoom control so that the registration chart frame touches the underscanned picture frame on the monitor.

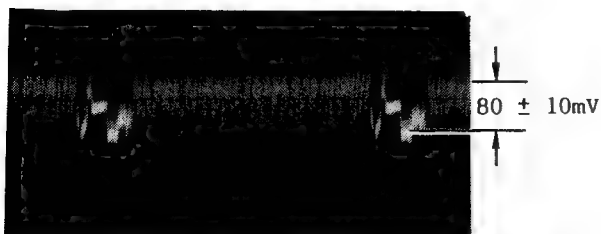


Monitor Screen

2. Adjust the iris control so that the video level is $500 \pm 20\text{mV}$ on the waveform monitor.



3. Adjust \odot RV4/IE-23 board so that the level at TP4/IE-23 board is $80 \pm 10\text{mV}$. Connection of a 10Kohm resistor between the oscilloscope probe and TP4 makes it easier to detect noise.



3-6-4. H. V. Ratio Adjustment

Object: Grayscale chart

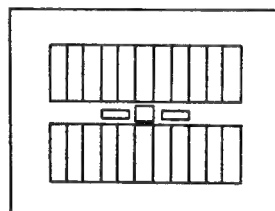
Equipment: B/W monitor screen

Preparation: Set the BARS WB switch on the side of the camera to 3200°K.

Rotate \odot RV5 (DTL LEVEL)/IE-23 board fully clockwise.

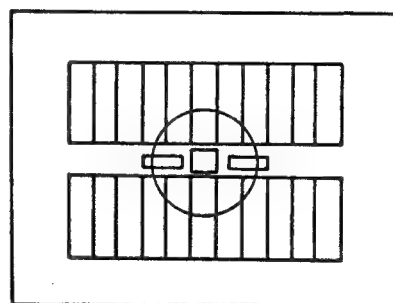
Adjustment:

1. Set the zoom control at TELE and shoot the grayscale chart.



Monitor Screen

2. Adjust the iris control so that the video level is $560 \pm 15\text{mV}$ on the waveform monitor.
3. Keep an eye on the white portion on the grayscale chart and adjust \odot RV3/IE-23 board so that the H and V detail volume is balanced.



Monitor Screen

3-6-5. Detail Level Adjustment

Object: Grayscale chart

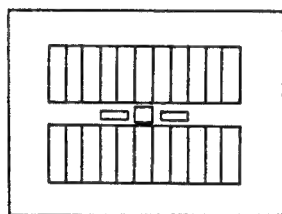
Equipment: Waveform monitor

Preparation: Set the BARS WB switch on the side of the camera to 3200°K.

Adjustment point: RV5/IE-23 board

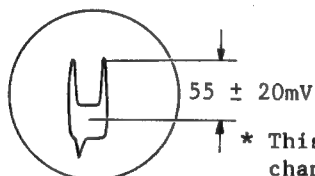
Adjustment:

1. Adjust the zoom control so that the grayscale chart frame touches the underscanned picture frame on the monitor.

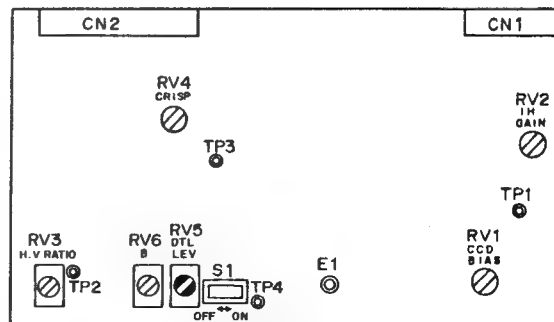
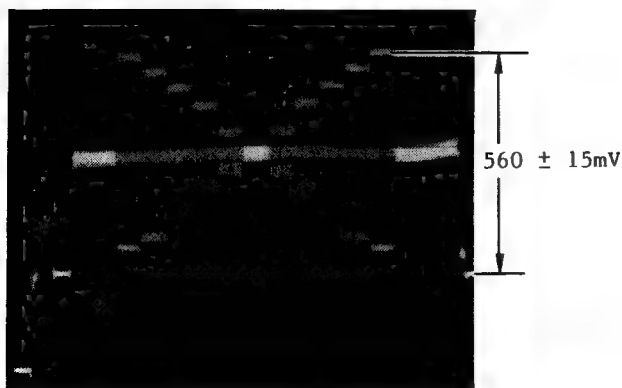


Monitor Screen

2. Adjust the iris control so that the video output level is $560 \pm 15\text{mV}$ on the waveform monitor.
3. Adjust RV5/IE-23 board so that the smaller detail level at both ends of the white level is $55 \pm 20\text{mV}$.



* This value should be changed according to the user's requirements.



IE-23 BOARD (COMPONENT SIDE)



IE-23 BOARD (PANEL SIDE)

3-7-3. Auto Iris Adjustment

Object: Grayscale chart

Equipment: Waveform monitor

To be extended: AT-53 board

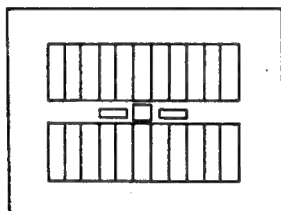
Preparation: Set the BARS WB switch on the side of the camera to 3200°K.

Set the iris control to AUTO.

Rotate \odot RV2 (IRIS MODE)/AT-53 board fully clockwise \odot .

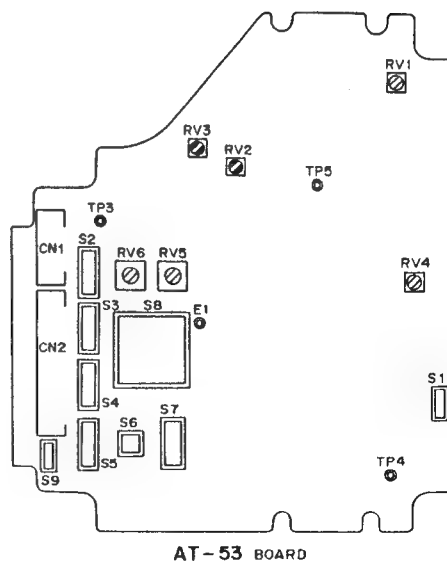
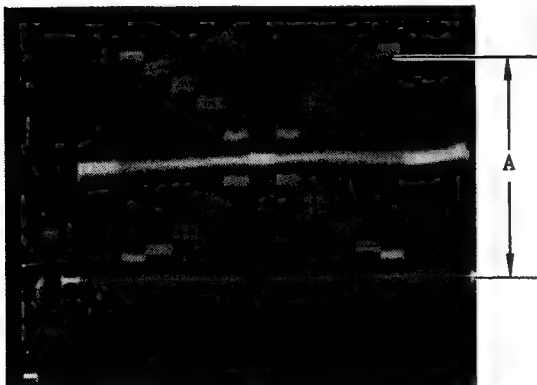
Adjustment:

1. Adjust the zoom control so that the grayscale chart frame touches the underscanned picture frame on the monitor.



Monitor Screen

2. Adjust \odot RV3 (IRIS SET)/AT-53 board so that the white peak level "A" is $700 \pm 15\text{mV}$.
3. Adjust \odot RV2 (IRIS MODE)/AT-53 board so that the white peak level "A" is $760 \pm 15\text{mV}$.
4. Adjust \odot RV3 (IRIS SET)/AT-53 board so that the white peak level "A" is $700 \pm 15\text{mV}$.



3-8. RESOLUTION ADJUSTMENT (DR-68 BOARD)

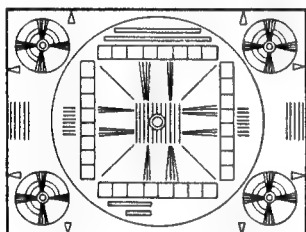
Object: Resolution chart

Equipment: Waveform monitor, Black and White monitor

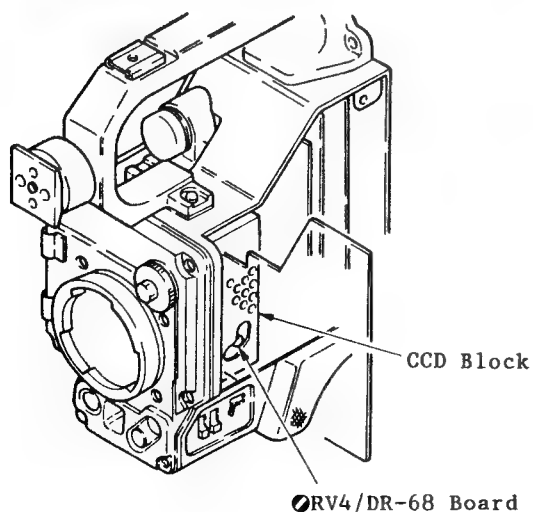
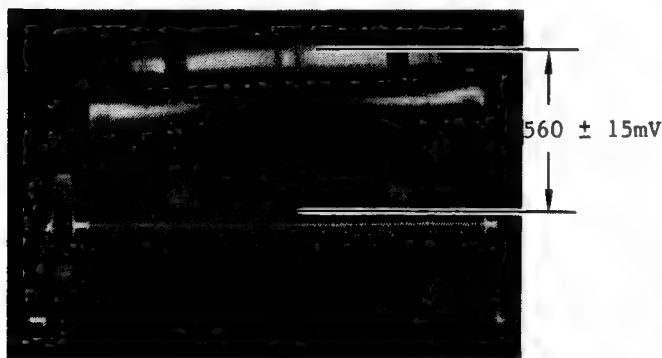
Preparation: Set the BARS WB switch on the side of the camera to 3200°K.

Adjustment:

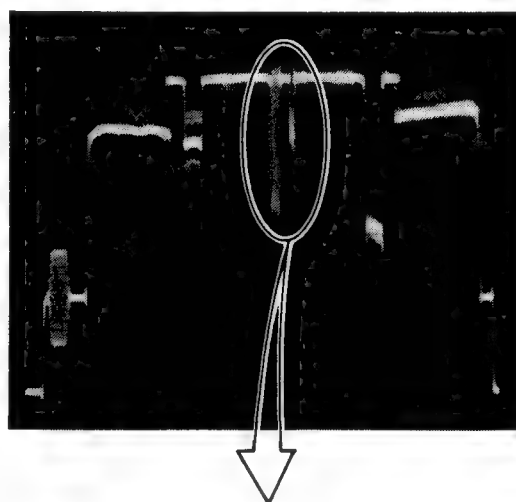
1. Adjust the zoom control so that the resolution chart frame touches the underscanned picture frame on the monitor.



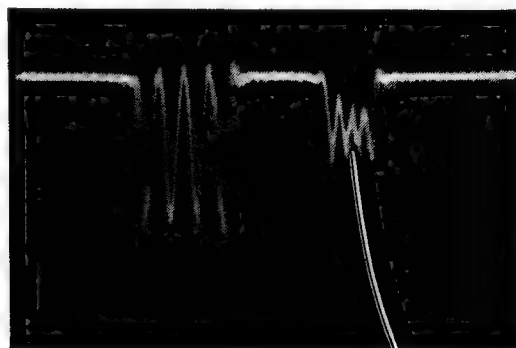
2. Adjust the iris control so that the white level of the video signal is $560 \pm 15\text{mV}$.



3. Adjust "LINE SELECTOR" of the waveform monitor so that a selected line is overlapped with 530-line of the resolution chart on the waveform monitor.
4. Adjust the focus control so that the amplitude portion "A" of the video signal is maximized.
5. Adjust RV4/DR-68 board so as to appear four negative peaks at the portion A of the resolution chart.



530 TV Line



appear four negative peaks

6. Adjust RV4/DR-68 board and RV6/IE-23 board repeatedly until the best resolution is obtained.

3-9. INTERCOM SYSTEM (CA-325/CA-13 BOARD)

3-9-1. SIDE TONE Adjustment

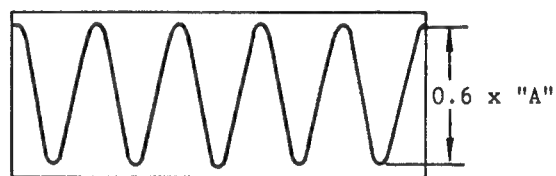
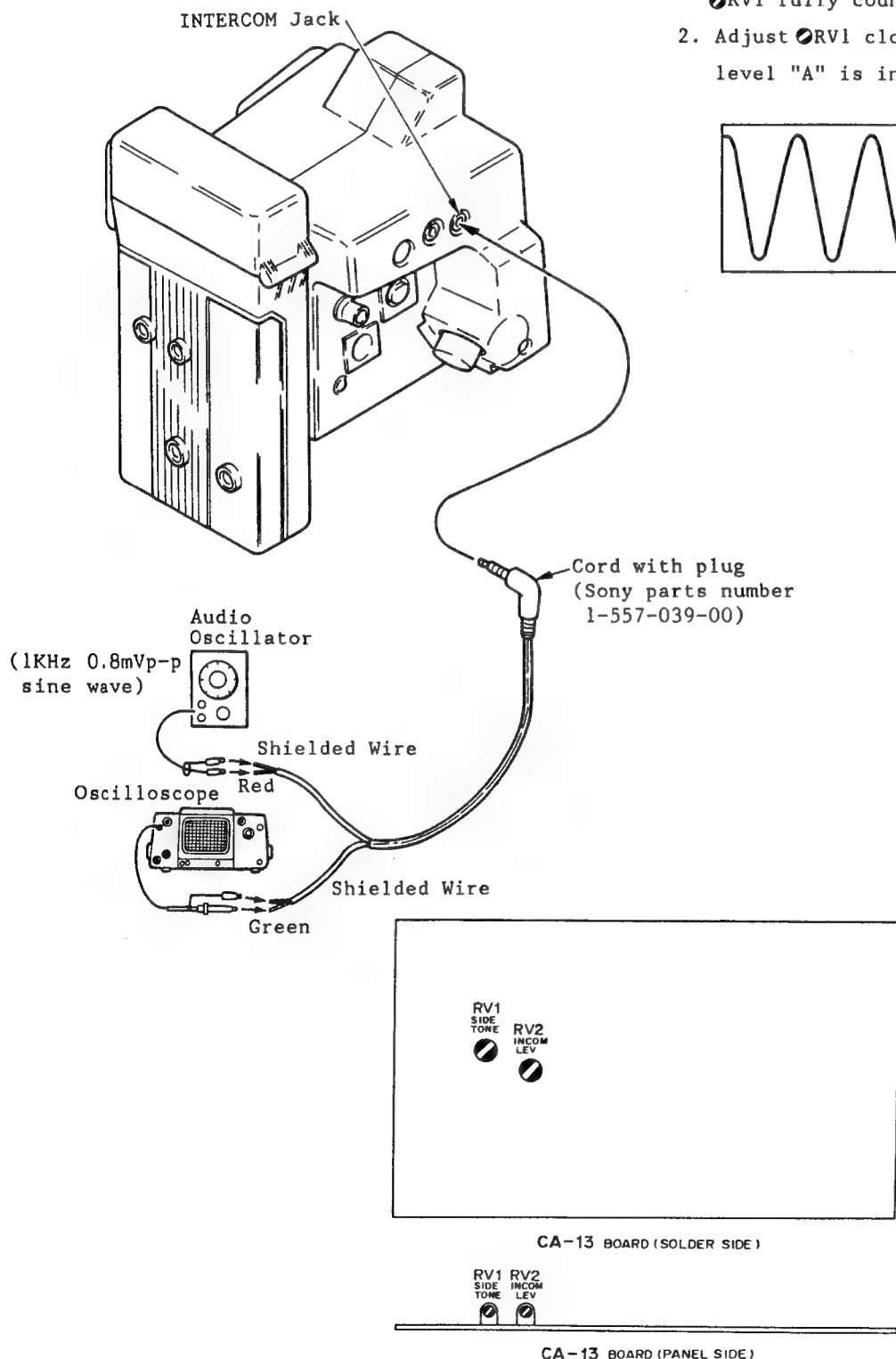
To be extended: CA-13 board

Equipment/Connection:

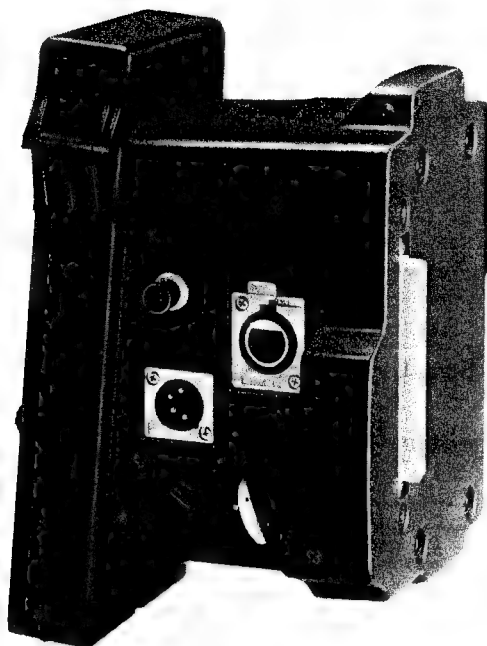
Preparation: Rotate \odot RV2 on the CA-13 board fully clockwise \odot .

Adjustment point: \odot RV1/CA-13 board

1. Measure the output level "A" when turning \odot RV1 fully counterclockwise.
2. Adjust \odot RV1 clockwise so that 60% of output level "A" is indicated.



CAMERA ADAPTOR



SPECIFICATIONS

Inputs/Outputs	VTR/CCU/CMA connector: Sony Q-type, 14-pin
	DC IN: XLR-type, Male 4-pin
	MIC IN: XLR-type, Female, 3-pin, balanced
	GEN LOCK: BNC-type, 75 ohms, unbalanced
	EARPHONE: mini jack
	INTERCOM: mini intercom jack
Power requirements	12 V DC
Weight	Approx. 960 g (2 lb 2 oz)
Dimensions	Approx. 129 × 197 × 148 mm (w/h/d)
	(5 1/8 × 7 7/8 × 5 7/8 inches)
Supplied accessories	Screws for attaching the CA-325/325P
	M4 × 6 (2)
	M4 × 12 (2)
	Operating Instructions (1)

Design and specifications are subject to change without notice.

SONY®
SERVICE MANUAL

TABLE OF CONTENTS

1. GENERAL DESCRIPTION

- 1-1. Precautions 1-1
- 1-2. Location and Function of Parts and
Controls 1-2
- 1-3. Attaching/Detaching the CA-325/325P 1-4

2. SERVICE INFORMATION

- 2-1. Board Layout 2-1
- 2-2. Removal of Cabinet 2-2
- 2-3. Connectors and Cables 2-3
 - 2-3-1. Connector Input/Output Signals 2-3
 - 2-3-2. Connections 2-5
 - 2-3-3. Removal of the CCQ Connector 2-7

SECTION 1

GENERAL DESCRIPTION

The CA-325/325P is a camera adaptor designed to be used with the Sony DXC-325/325P series color video camera. This instruction manual is for both the CA-325 and the CA-325P. The operating instructions for both camera adaptors are the same, but their signal systems and their color video cameras to be connected are different.

	Signal system	Color video camera
CA-325	EIA standards, NTSC color system	DXC-325 series camera
CA-325P	CCIR standards, PAL color system	DXC-325P series camera

Please refer to the camera's instruction manual for details of the camera adaptor's operation.

1-1. PRECAUTIONS

Operation

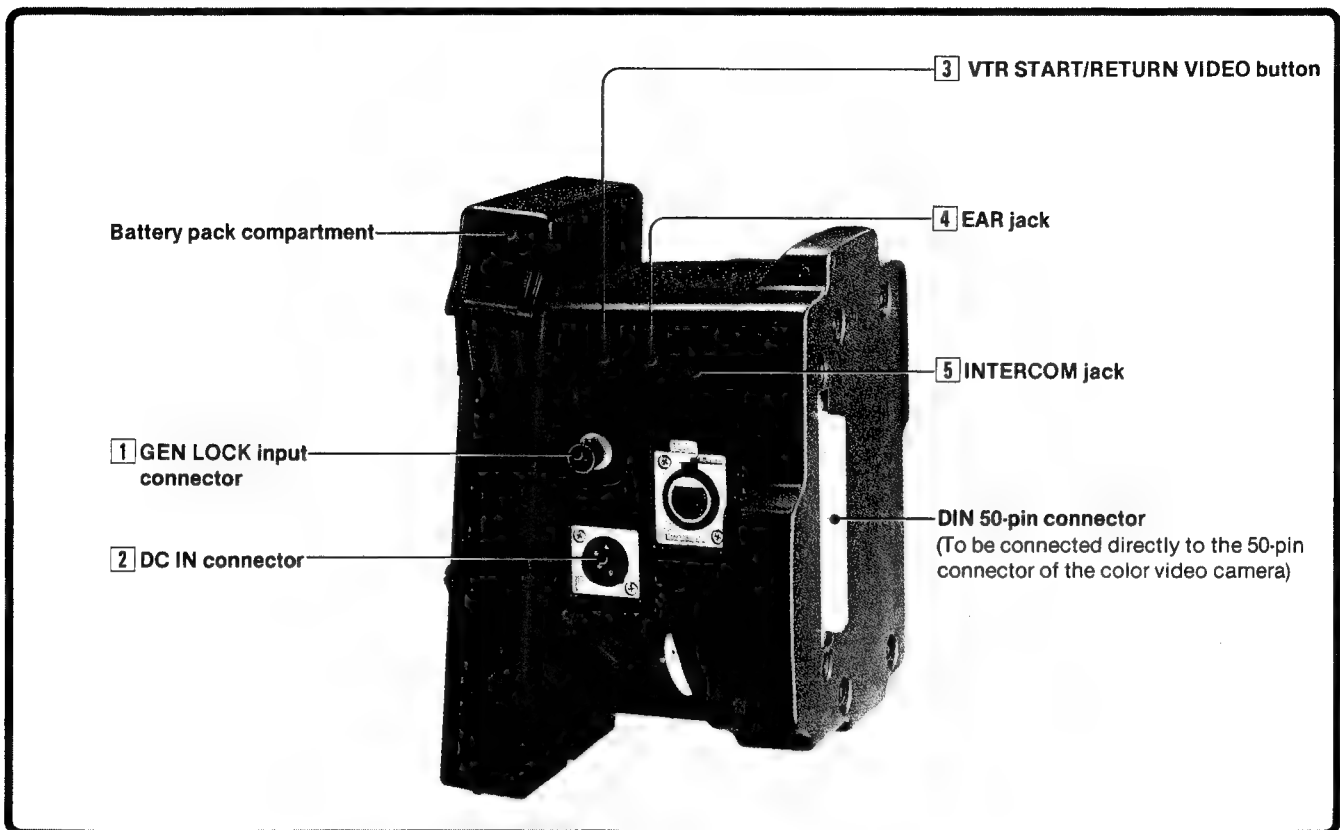
- Do not use the unit in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Allow adequate air circulation to prevent internal heat build-up.
- Do not expose the unit to the extremely high temperature and humidity.

Cleaning

Clean the cabinet, panel and controls with a dry soft cloth, or soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine, which might damage the finish.

If you have any questions about this unit, contact your authorized Sony dealer.

1-2. LOCATION AND FUNCTION OF PARTS AND CONTROLS



1 GEN LOCK input connector (BNC connector)
Connect the gen-lock input signal (VBS or BS) for synchronization here. No connection is necessary when only one camera is used.

2 DC IN (input) connector (XLR 4-pin)
This connector is equipped for supplying power from an external DC power supply (12 V DC).



Pin assignment
1: GND
2: NC
3: NC
4: +12 V DC

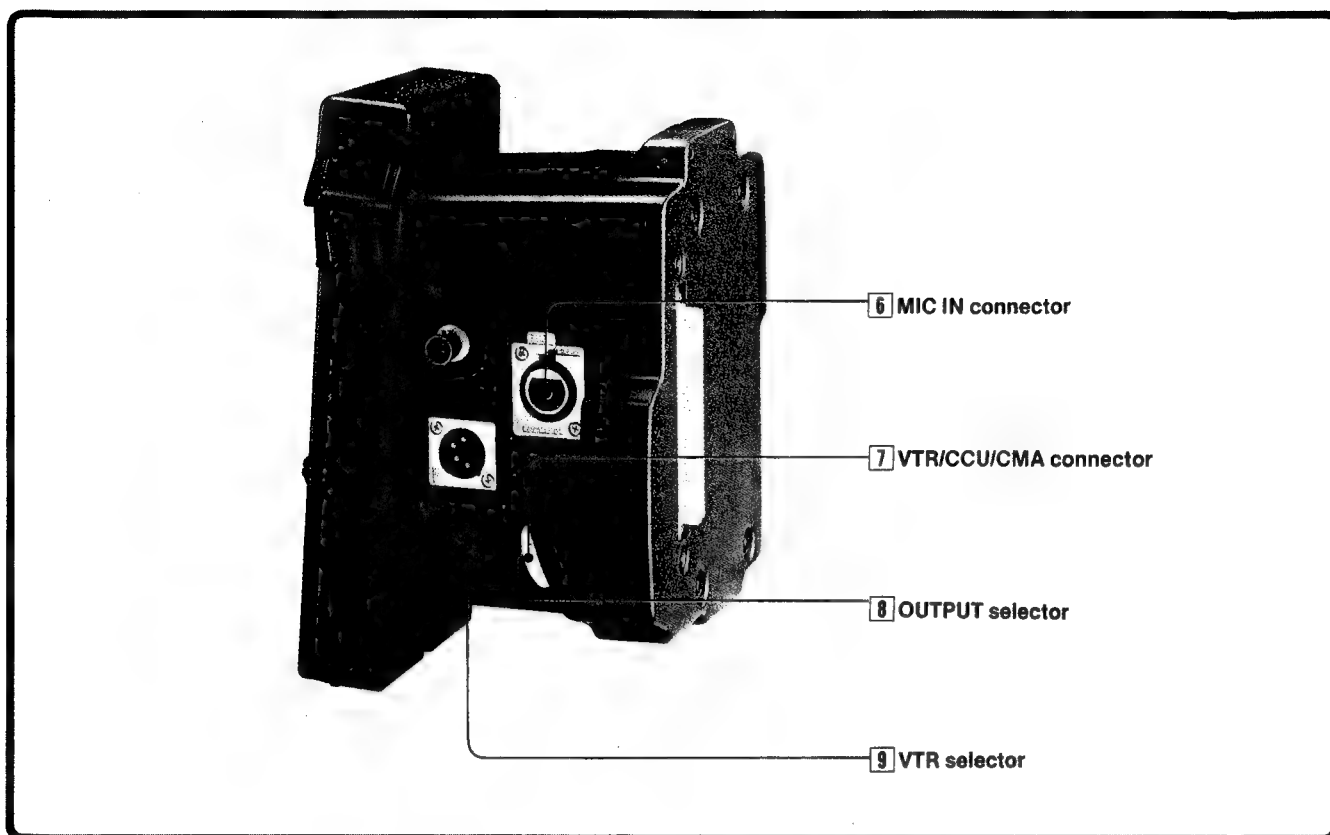
Note

When the power is supplied to this connector, the power is automatically cut off from both the NP-1A inside the battery pack compartment and the VTR/CCU/CMA connector.

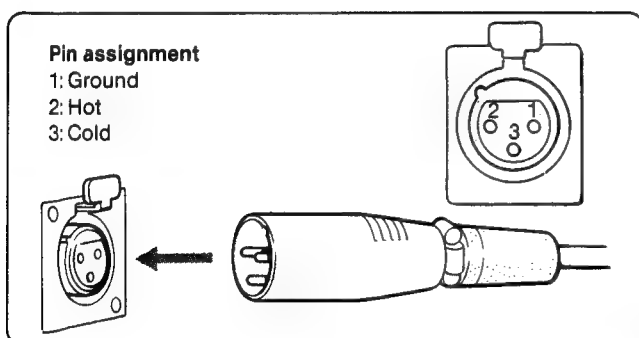
3 VTR START/RETURN VIDEO button
When the camera is connected to a portable VTR, press this button to start recording. To stop recording, press the button again.
If the camera is connected to a CCU-M3/M3P camera control unit, the return video picture can be monitored on the viewfinder screen while the button is kept depressed. When the button is released, the camera picture can be monitored.

4 EAR (earphone) jack (mini jack)
Connect an earphone to monitor the playback or recording sound from the VTR.

5 INTERCOM jack (mini intercom jack)
Connect a DR-100 intercom headset (optional) here. It will be possible to communicate between the camera and the operator of the connected camera control unit or video switcher.



- 6 MIC IN (microphone input) connector** (XLR 3-pin, unbalanced)
Connect a microphone here.



- 7 VTR/CCU/CMA connector**
Used to connect the video camera to a CCU-M3/M3P camera control unit or a CMA-8/8CE camera adaptor. All video, audio, and control signals as well as power are supplied from/to the video camera via this connector.
- 8 OUTPUT selector**
Used to select the signal to be output from the VTR/CCU/CMA connector **7**.
Y/C: A Y/C separate signal will be output.
VBS: A composite video signal will be output.

- 9 VTR selector**
Set to the appropriate position, according to the equipment (VTR, CCU) to be used. For details, refer to the camera's instruction manual.
- 1: For a VTR equipped with a Q-type (14-pin) camera connector such as the Sony VO-6800/6800PS, BVU-110/110P or for the CCU-M3/M3P.
 - 2: For a VTR equipped with a K-type (14-pin) camera connector, such as the Sony SL-2000 (NTSC), SL-F1E (PAL) or other Betamax VTRs used for home entertainment.
 - 3: For a VHS format VTR manufactured by JVC.
 - 4: For a VHS format VTR manufactured by Panasonic.
For an S-VHS format VTR manufactured by Panasonic.

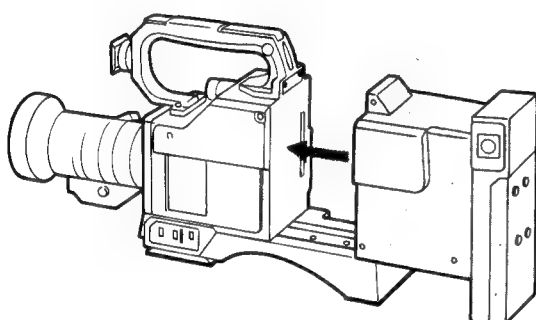
Caution

Be sure to set the VTR selector to the correct position for the VTR used. If it is not, the VTR might not operate properly.

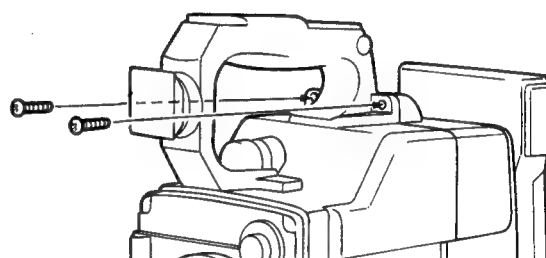
1-3. ATTACHING/DETACHING THE CA-325/325P

To attach the CA-325/325P to the video camera

- 1 Push the camera adaptor forward along the groove.**

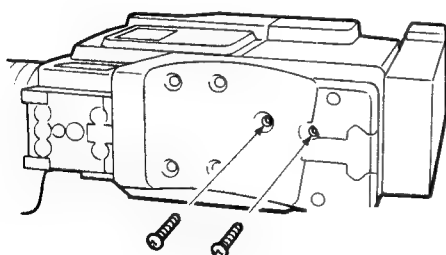


- 2 Fix the camera adaptor with the two screws at the connecting part.**



Use the supplied screws
M4 × 12.

- 3 Tighten the two screws at the bottom of the shoulder pad.**



Use the supplied screws
M4 × 6.

To detach the CA-325/325P from the video camera

- 1 Remove the two screws at the bottom of the shoulder pad.**

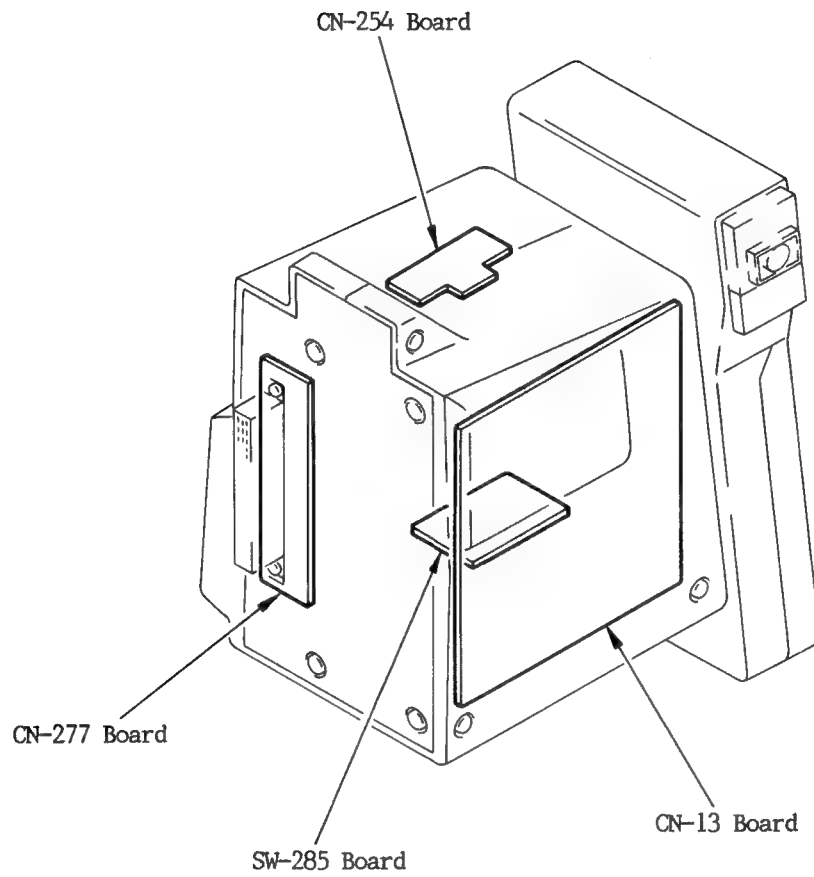
- 2 Remove the two screws at the connecting part.**

- 3 Pull the camera adaptor back and off.**

SECTION 2

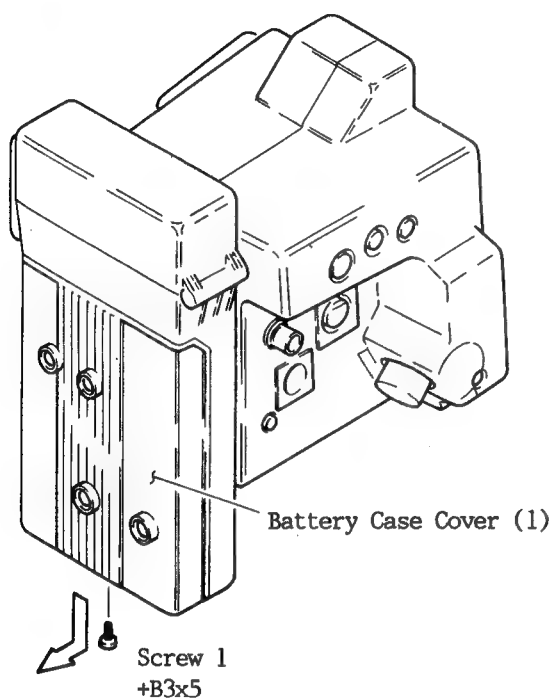
SERVICE INFORMATION

2-1. BOARD LAYOUT

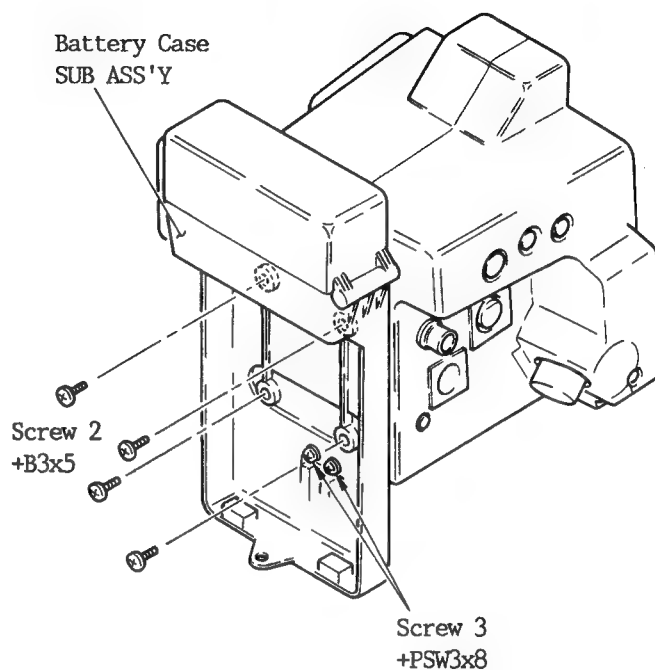


2-2. REMOVAL OF CABINET

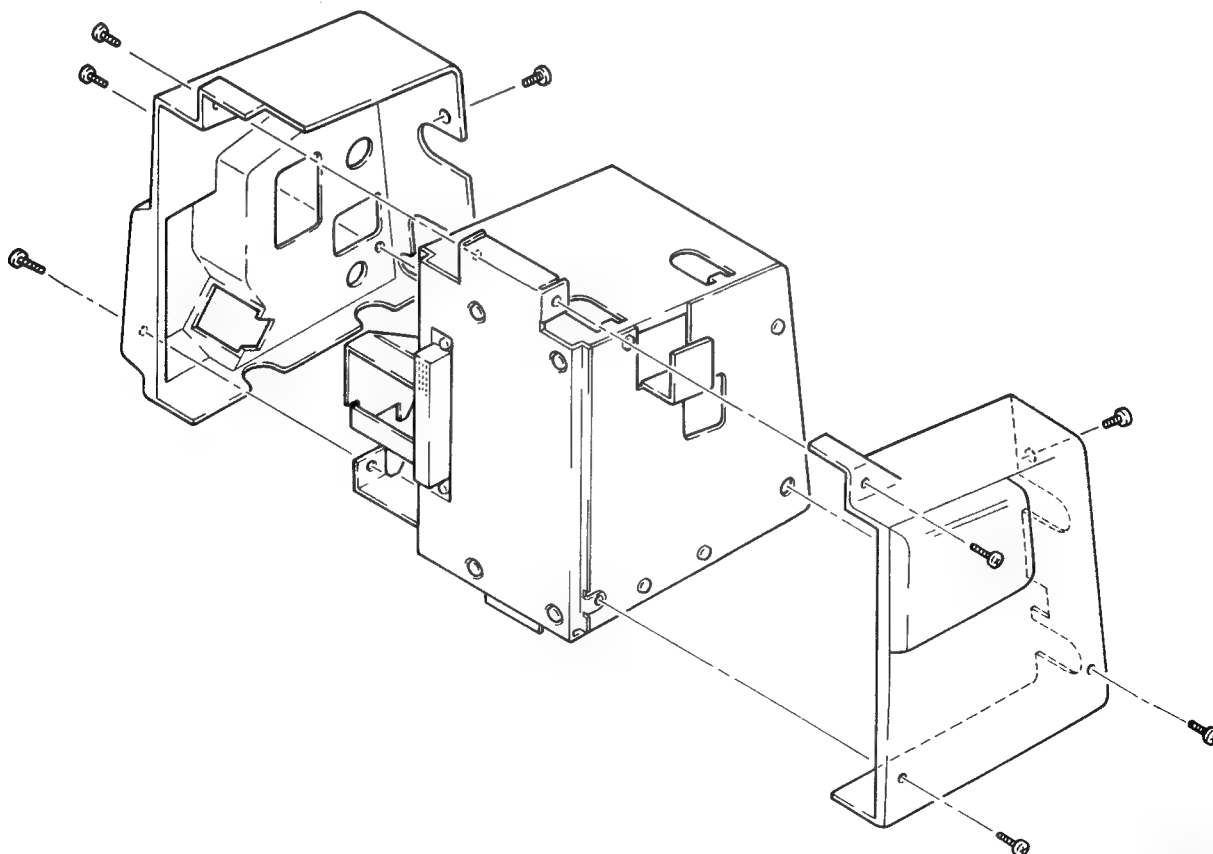
1. Remove the screw (+B3x5) shown in the figure and remove the battery case cover (1).



2. Remove the four screws (+B3x5) and loosen the two screws (+PSW3x8). Remove the battery case SUB ASSY.



3. Remove the eight screws (+B3x5) and remove the side panels.



2-3. CONNECTORS AND CABLES

2-3-1. Connector Input/Output signals

The main connector input/output signals are as follows:

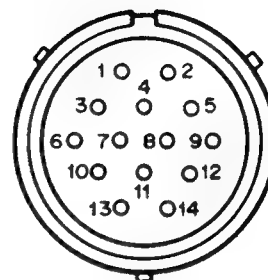
VIDEO OUT; 1.0Vp-p \pm 0.1V, sync negative

75 Ω

GEN LOCK; 1.0Vp-p, sync negative

75 Ω

VTR/CCU (14P)



(EXT VIEW)

CCU		Pin No.	VTR	
REMARK FOR SIGNAL	SIGNAL		SIGNAL	REMARK FOR SIGNAL
10.6V~17V, 3A	UNREG GND	1	UNREG GND	10.6V~17V, 3A
	UNREG + 12V IN	2	UNREG + 12V IN	
-20dBs, 600 Ω	INCOM OUT (X)	3	MIC OUT (X)	-60dBs, 600 Ω
	INCOM OUT (Y)	4	MIC OUT (Y)	
	INCOM OUT (G)	5	MIC OUT (G)	
1.0Vp-p, 75 Ω	COMPOSITE VIDEO OUT (X)	6	COMPOSITE VIDEO OUT (X) Y VIDEO OUT (X)	1.0Vp-p, 75 Ω
	COMPOSITE VIDEO OUT (G)	7	COMPOSITE VIDEO OUT (G) Y VIDEO OUT (G)	
1.0Vp-p, 75 Ω	RETURN VIDEO IN (G)	8	RETURN VIDEO IN (G)	1.0Vp-p, 75 Ω
	RETURN VIDEO IN (X)	9	RETURN VIDEO IN (X)	
This signal is used for controlling CCU.	SERIAL DATA IN/OUT	10	BATTERY ALARM IN	(Note 1)
0.7Vp-p, 75 Ω	R OUT (X)	11	CHROMA VIDEO OUT	This signal is not used in VTR.
0.7Vp-p, 75 Ω	G OUT (X)	12	REC/ALARM IN	(Note 2)
ON; 4.5 \pm 0.5Vdc OFF; 0 \pm 0.5Vdc	TALLY IN	13	VTR START/STOP OUT	START; 4.5 \pm 0.5Vdc STOP; 0 \pm 0.5Vdc
0.7Vp-p, 75 Ω	B OUT (X)	14	POWER SAVE OUT/ AUDIO MONITOR IN	SAVE; 4.5 \pm 0.5Vdc (across 10k Ω) STANDBY; 9.0 \pm 0.5Vdc (across 10k Ω) MONITOR; -6dB, 750 Ω

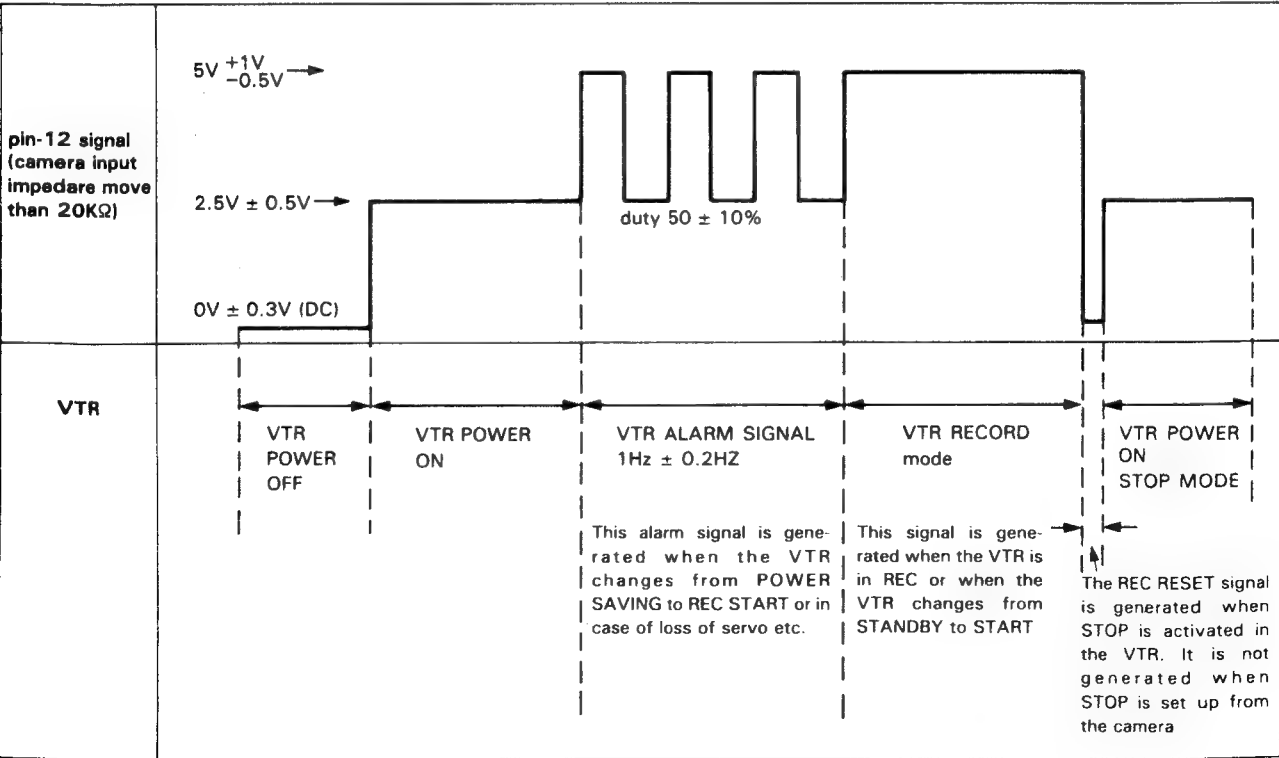
Note 1. Signal at Pin 10

Battery voltage detection and warning signal generating circuits are located within the VTR. This signals are supplied from the VTR to the camera to either blink or light the LED at the bottom of the viewfinder.

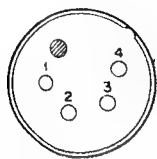
BATTERY TERMINAL ADAPTOR (VTR INTERNAL BATTERY)	DC12V ~ 11.1V	DC11.1V ~ 10.8V	PIN 10 TURNS HIGH AT DC 10.8V. 10.6V DC or below the VTR Internal Power is cut off so that the Battery Power is sent to Pin 13.
PIN 10 OUTPUT FROM VTR	0V	1Hz \pm 0.2Hz duty 50 \pm 10%	DC2 ~ 3V across 300 Ω
LED IN VIEWFINDER	NEITHER BLINKS NOR LIGHTS	BLINKS AT 1Hz	LIGHTS

Note 2: Signal at Pin 12

When the VTR is ON the input to the camera at pin 15 is 2.5V DC. In VTR record mode the voltage is 5V DC. When servo is not applied or if alarm signals are generated within the VTR an alternating 1 Hz signal (2.5 Vp-p with 2.5 V DC as reference) is sent to the camera. At the tape end when the VTR enters Stop mode or when setting up the Stop mode from the VTR, 0V DC is generated from 10 msec to 100 msec (called REC RESET). After REC RESET the signal level returns to 2.5 V DC.



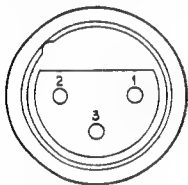
DC (4 P, MALE)



(EXT VIEW)

No.	SIGNAL	SPECIFICATION
1	EXT DC IN (G)	GND
2		
3		
4	EXT DC IN (X)	10.5 to 17.0 Vdc, 2A

MIC (3 P, FEMALE)



(EXT VIEW)

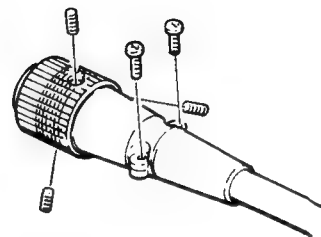
No.	SIGNAL	SPECIFICATION
1	MIC IN (G)	GND for MIC
2	MIC IN (X)	-60 dBm $Z_i \leq 600 \Omega$
3	MIC IN (Y)	BALANCED

2-3-3. Removal of the CCQ connector

CCQ Connector (Removal of the connector)

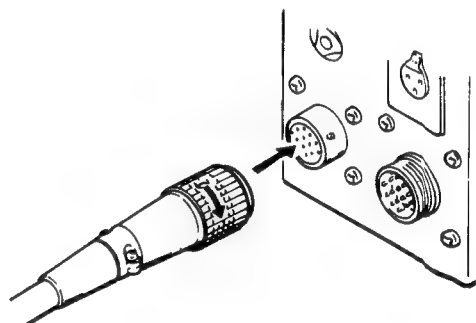
Step 1.

Remove the three hexagonal setscrews and the two \oplus setscrews.



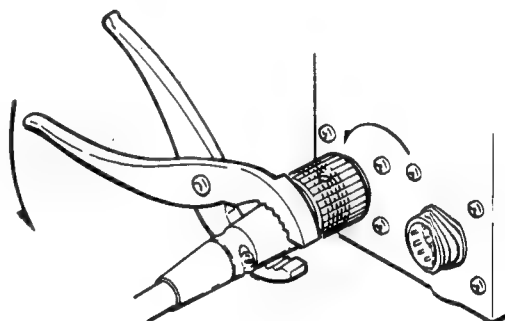
Step 2.

Fix the CCQ connector at the camera or VTR connector.



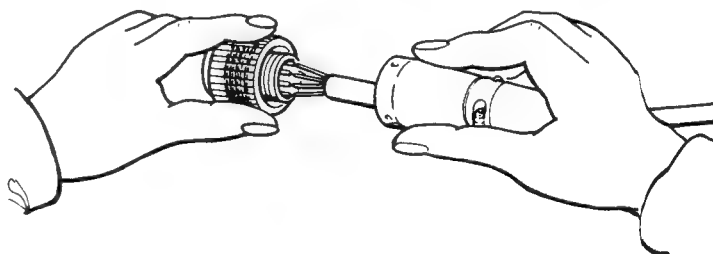
Step 3.

Rotate the CCQ connector to counterclockwise by the plier and loosen it.



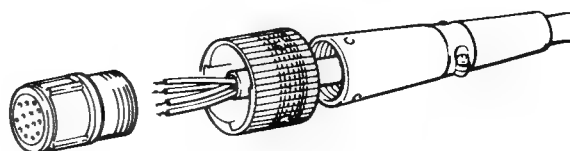
Step 4.

It can be removed by hand and unsolder

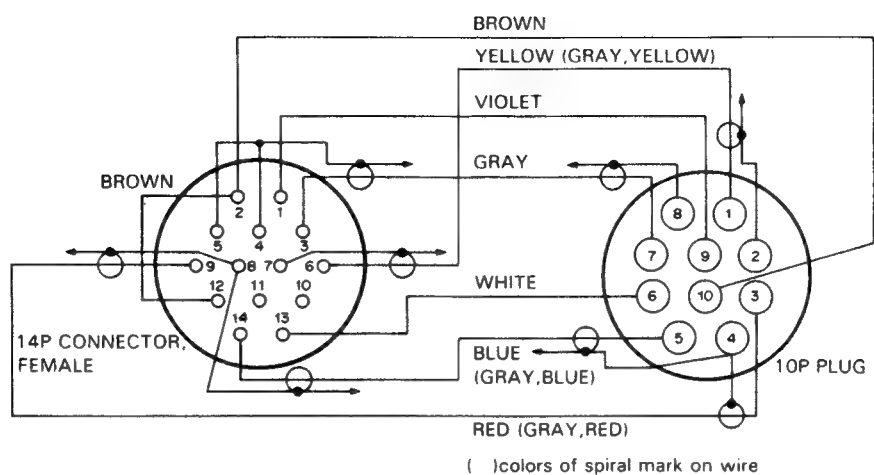


Step 5.

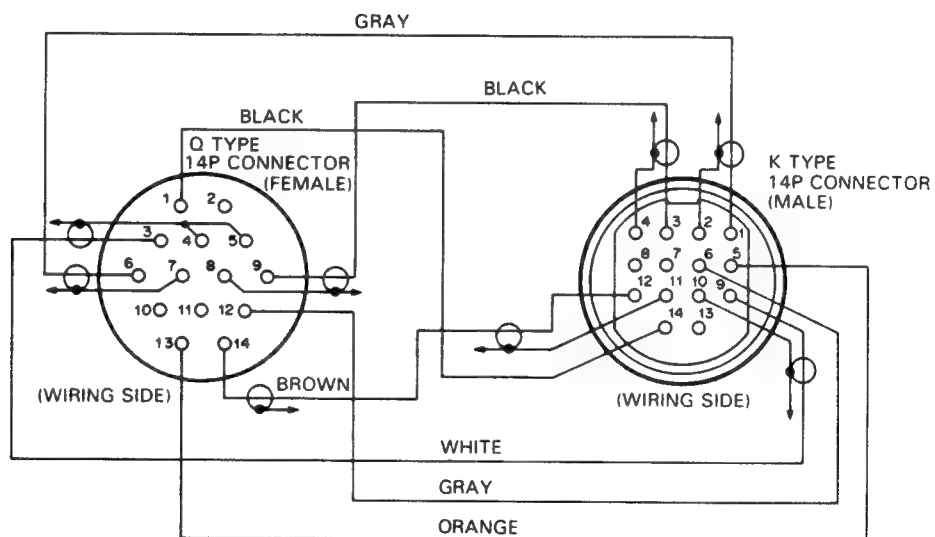
It can be broken up as shown in Figure.

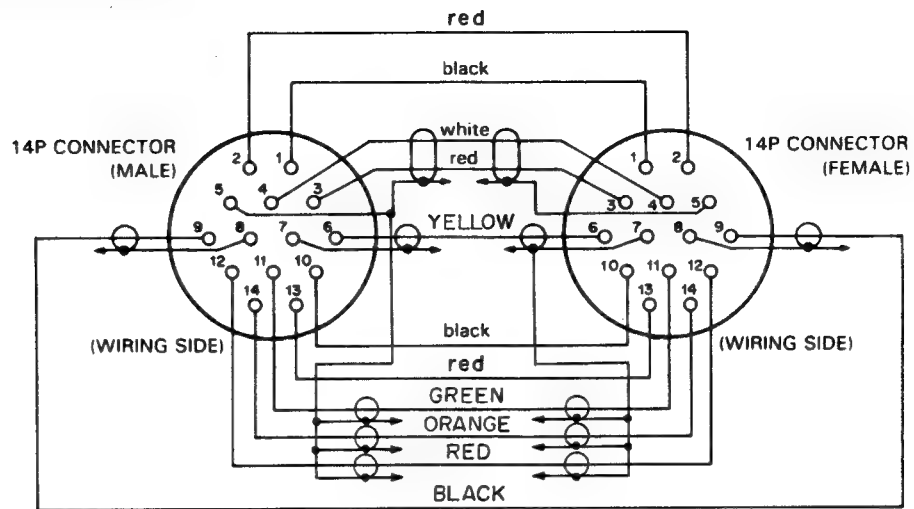
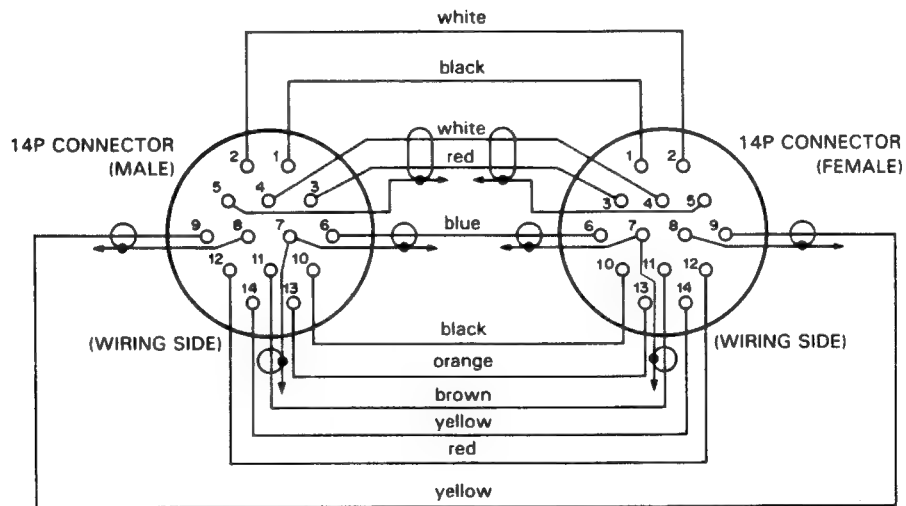


CCQJ cable (Wiring diagram)



CCQK cable (Wiring diagram)



CCQ-nAM cable (Wiring diagram)**CCQ-nARS/nBRS cable (Wiring diagram)**

Note: Shielded wire of pin 11 is only nBRs cable.

1.5INCH ELECTRONIC VIEWFINDER



SPECIFICATIONS

Picture tube	1.5-inch monochrome
Indicators	REC/TALLY indicator BATT indicator SHUTTER indicator GAIN UP indicator
Resolution	400 lines
Power requirements	12 V DC
Power consumption	2.3 W
Weight	Approx. 500 g (1 lb 2 oz)
Dimensions	Approx. 186 × 63 × 189 mm (w/h/d) (7 ³ / ₈ × 2 ¹ / ₂ × 7 ¹ / ₂ inches)
Supplied accessory	Operating Instructions (1)

Design and specifications are subject to change without notice.

SONY®
SERVICE MANUAL

TABLE OF CONTENTS

1. GENERAL DESCRIPTION

1-1. Precautions	1-1
1-2. Location and Function of Parts and Controls	1-2
1-3. How to Attach to Camera	1-3
1-4. For Easy Operation of the Viewfinder	1-4
1-5. Diopter Adjustment (Adjustable range: from -1D to -3D)	1-5
1-6. Operation	1-5

2. SERVICE INFORMATION

2-1. Board Layout	2-1
2-2. Replacement of CRT/DY Ass'y	2-2

3. ALIGNMENT

3-1. Preparation	3-1
3-1-1. Equipment Required	3-1
3-2. Connection and Initial Setting	3-1
3-2-1. Initial Setting	3-1
3-3. VF System Adjustment	3-2
3-3-1. Vertical Hold Adjustment	3-2
3-3-2. Horizontal Hold Adjustment	3-2
3-3-3. Bright Calibration Adjustment	3-3
3-3-4. Focus Adjustment	3-3
3-3-5. Picture Frame Adjustment	3-4

SECTION 1

GENERAL DESCRIPTION

The DXF-325/325CE is a 1.5-inch monochrome electronic viewfinder designed to be used with the Sony DXC-325/325P series color video camera. This instruction manual is for both the DXF-325 and the DXF-325CE. The operating instructions for both viewfinders are the same, but their signal systems and their color video cameras to be connected are different.

	Signal system	Color video camera
DXF-325	EIA standards, NTSC color system	DXC-325 series camera
DXF-325CE	CCIR standards, PAL color system	DXC-325P series camera

Please refer to the camera's instruction manual for the viewfinder's operation.

1-1. PRECAUTIONS

Operation

- Do not use the unit in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Do not point the viewfinder directly at the sun, or the plastics inside the viewfinder may be damaged.
- Do not use the viewfinder outside the temperature extremes of -10°C to $+45^{\circ}\text{C}$ (14°F to 113°F).
- Should any liquid or solid object fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Allow adequate air circulation to prevent internal heat build-up.
- Do not expose the unit to the extremely high temperature and humidity.

Cleaning

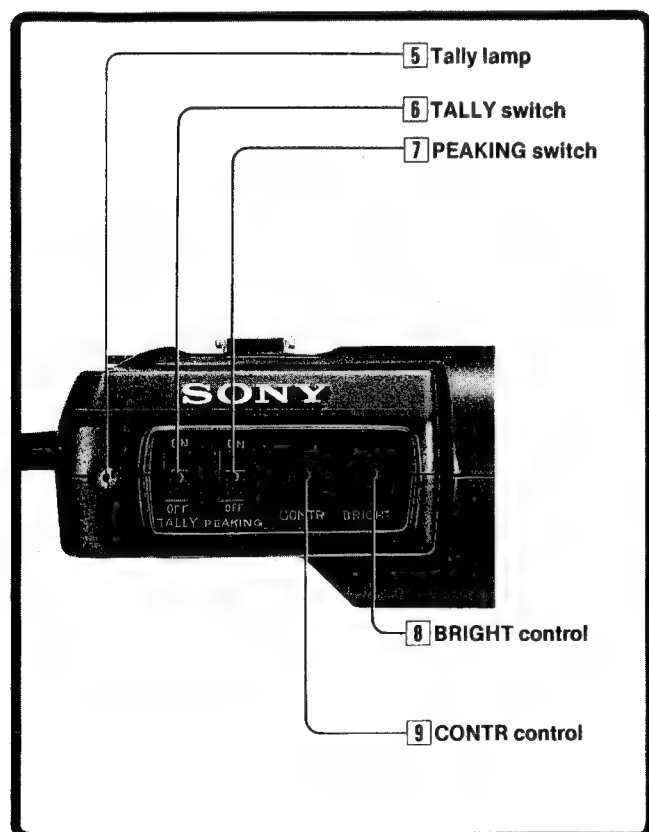
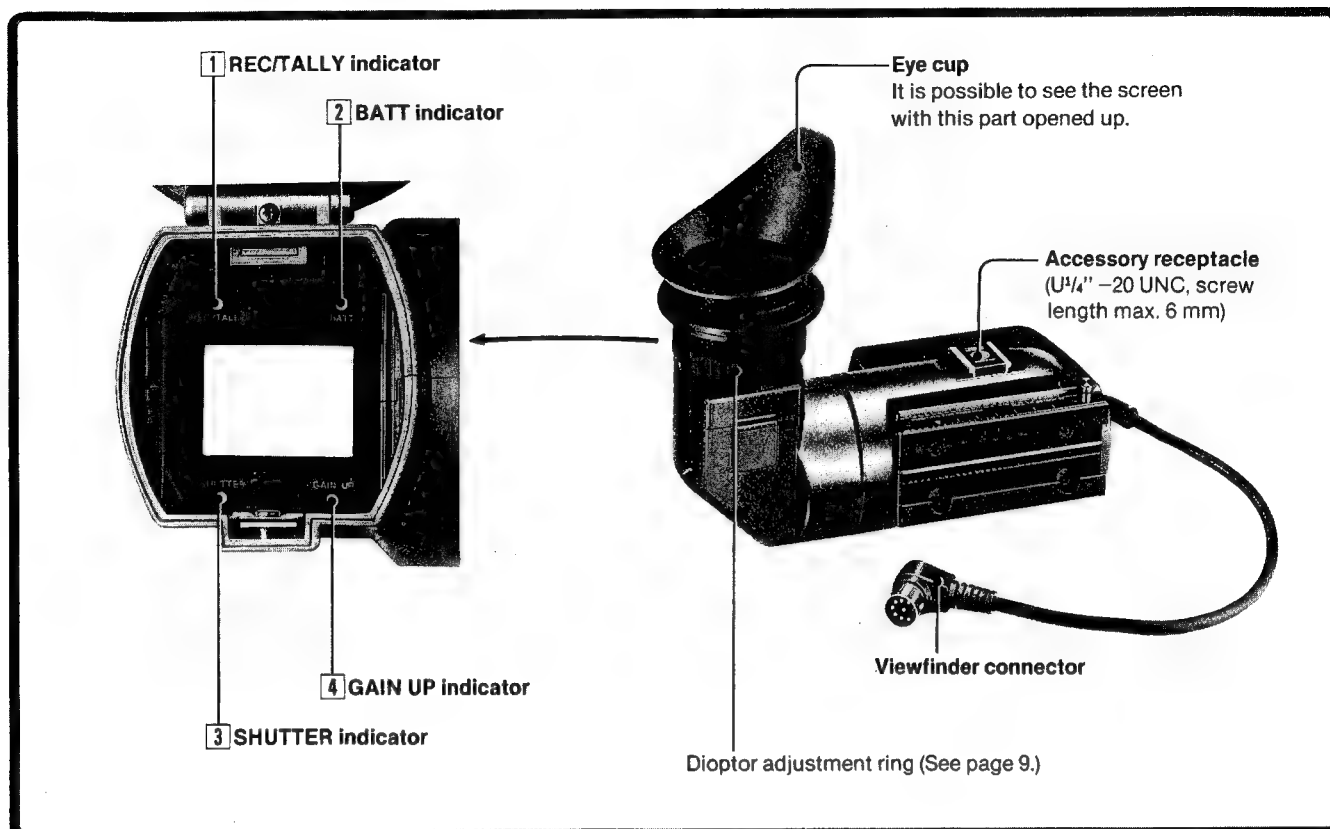
Clean the cabinet, panel and controls with a dry soft cloth, or soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine, which might damage the finish.

Repacking

Do not discard the carton. It affords maximum protection whenever the unit is transported.

If you have any questions about this camera, contact your authorized Sony dealer.

1-2. LOCATION AND FUNCTION OF PARTS AND CONTROLS



1 REC/TALLY indicator

Illuminates during recording with one camera, and illuminates when the camera's picture is selected by a control console, a video switcher, etc., connected to the CCU-M3/M3P camera control unit which is connected to the camera.

The indicator blinks in accordance with the warning system of the VTR.

2 BATT (battery) indicator

Starts blinking several minutes before the battery of the camera or the VTR is discharged to a level at which it cannot power the camera or the VTR (about 11 V), and illuminates steadily when the battery has discharged to that level.

3 SHUTTER indicator

Lights up when the SHUTTER ON/OFF switch of the camera is set to ON.

4 GAIN UP indicator

Lights up when the GAIN selector is set to the 9 dB or 18 dB position.

5 Tally lamp

When the TALLY switch 6 is set to ON, this lamp operates the same as the REC/TALLY indicator 1.

6 TALLY switch

ON: The tally lamp 5 is activated.

OFF: The tally lamp 5 is deactivated.

7 PEAKING switch

ON: The picture on the viewfinder screen will be sharpened so that the lens can be easily focused.

OFF: Normal position.

8 BRIGHT (brightness) control

Used to adjust the brightness of the picture on the viewfinder screen.

This control does not affect the output signal of the camera.

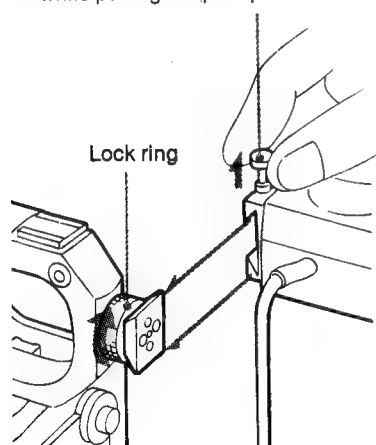
9 CONTR (contrast) control

Used to adjust the contrast of the picture on the viewfinder screen.

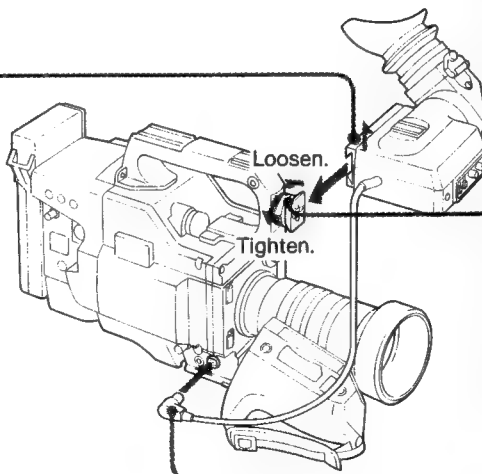
This control does not affect the output signal of the camera.

1-3. HOW TO ATTACH TO CAMERA

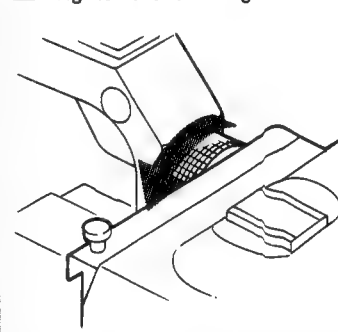
- 1 Loosen the lock ring, and align and slide the viewfinder into the mount while pulling the pin up.



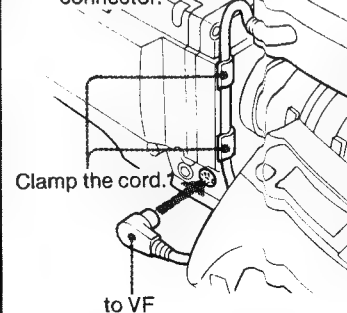
To detach the viewfinder, loosen the lock ring, and slide the viewfinder while pulling the pin up.



- 2 Tighten the lock ring.



- 3 Connect the viewfinder connector.



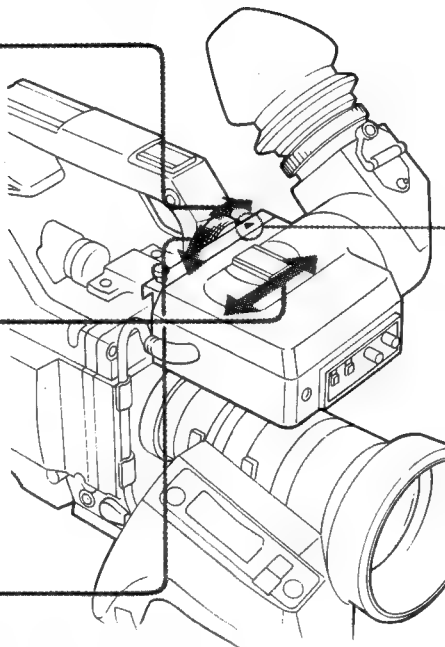
1-4. FOR EASY OPERATION OF THE VIEWFINDER

Adjustment of the horizontal position

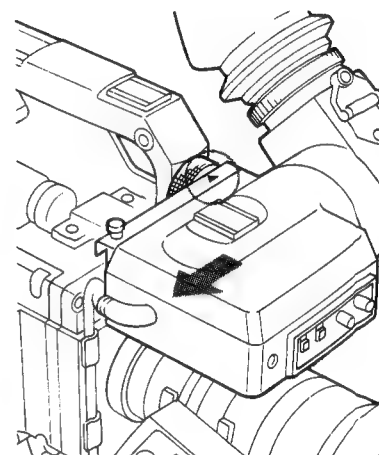
- 1 Loosen the lock ring.

- 2 Slide the viewfinder to the desired position.

- 3 Tighten the ring.

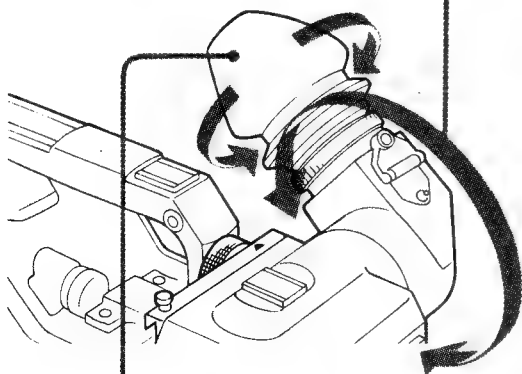


To insert the camera into the carrying case with the viewfinder attached to it, slide the viewfinder to the "▼" mark and tighten the lock ring.



Adjustment of the eye cup position

- 1 Move the eye cup up and down for comfortable use.



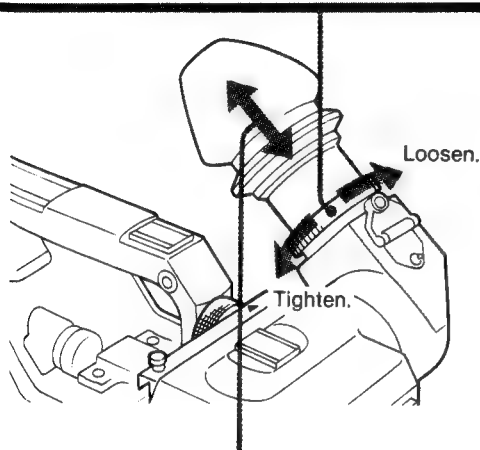
- 2 Rotate the eye cup to fit the eye.

1-5. DIOPTER ADJUSTMENT

(Adjustable range : from $-1D$ to $-3D$)

Since each operator's eyesight varies, it is necessary to adjust the diopter each time the viewfinder is used by a new operator. Adjust the diopter after focusing as follows.

1 Loosen the ring.



2 Slide this part back and forth so that the image can be monitored clearly.
Tighten the ring.

1-6. OPERATION

1 Turn on the power to the camera. The power is supplied to the viewfinder automatically.

2 Adjust the position and angle of the viewfinder screen for easy viewing as shown in "For Easy Operation of the Viewfinder" on page 8.
If necessary, adjust the diopter as shown in "Diopter Adjustment" on page 9.

3 Adjust the CONTR and BRIGHT controls for the best picture.

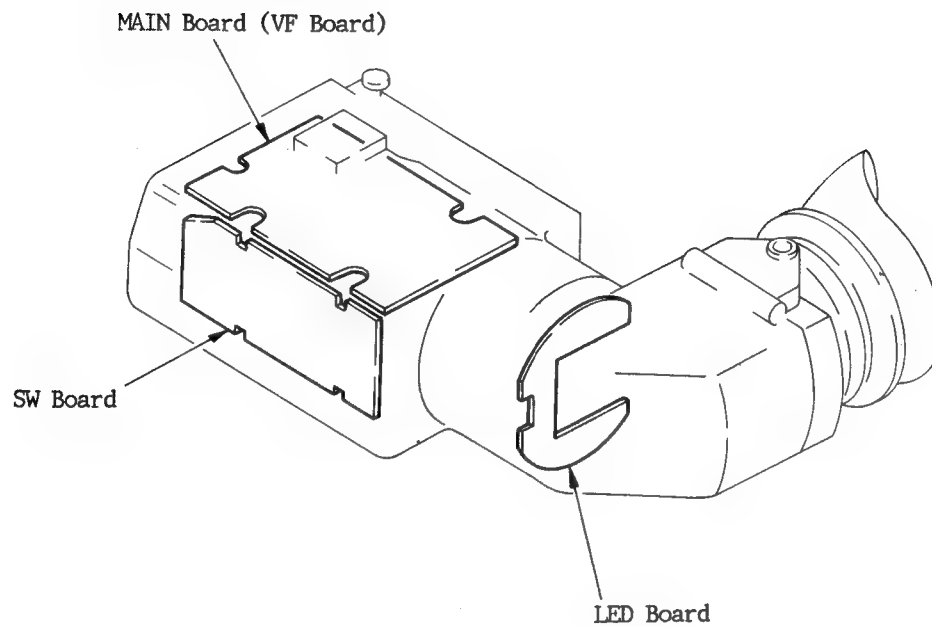
4 While recording, the picture shot by the camera appears on the screen, and the REC/TALLY indicator lights.

- When the VTR is in the playback mode, the playback picture appears on the screen.
- The settings of the PEAKING switch, and the CONTR and BRIGHT controls do not affect the video output signal of the camera.
- When the BRIGHT control is turned fully counterclockwise, the picture does not appear on the screen.

SECTION 2

SERVICE INFORMATION

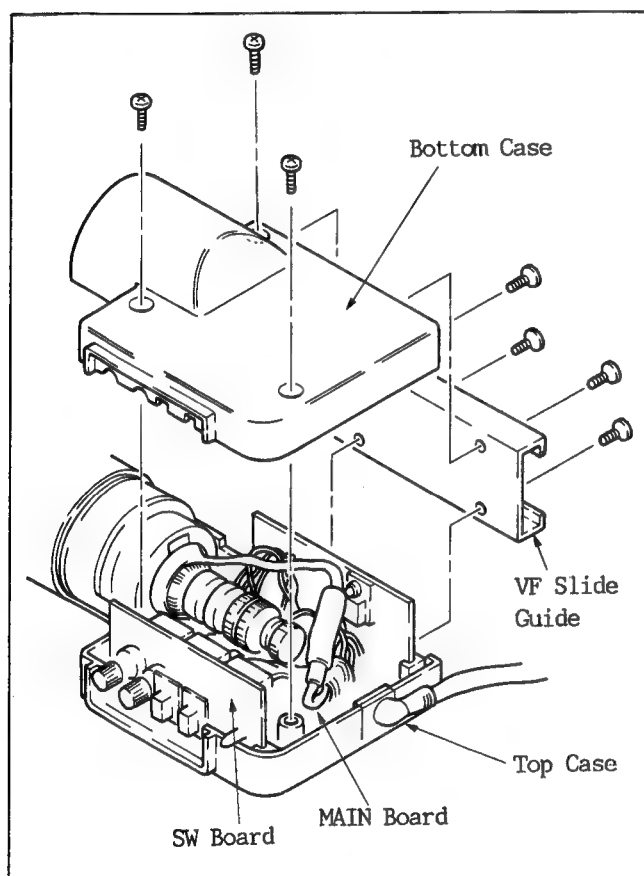
2-1. BOARD LAYOUT



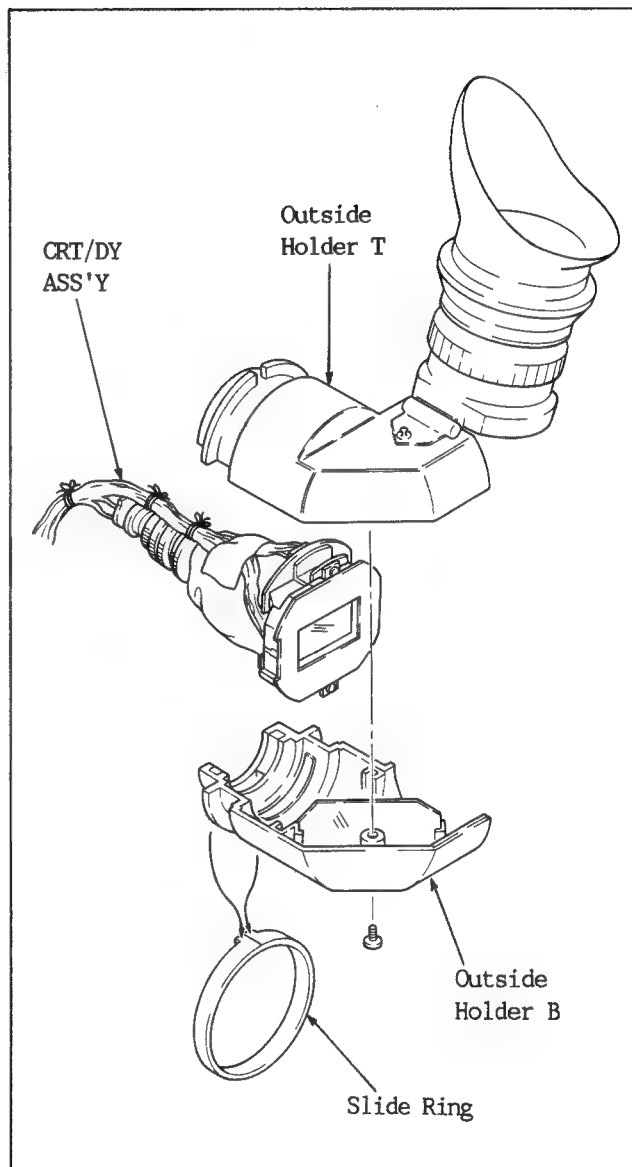
2-2. REPLACEMENT OF CRT/DY ASSY

Note: If a deflection yoke is replaced, you should replace assembly of CRT and deflection yoke (CRT/DY ASSY).

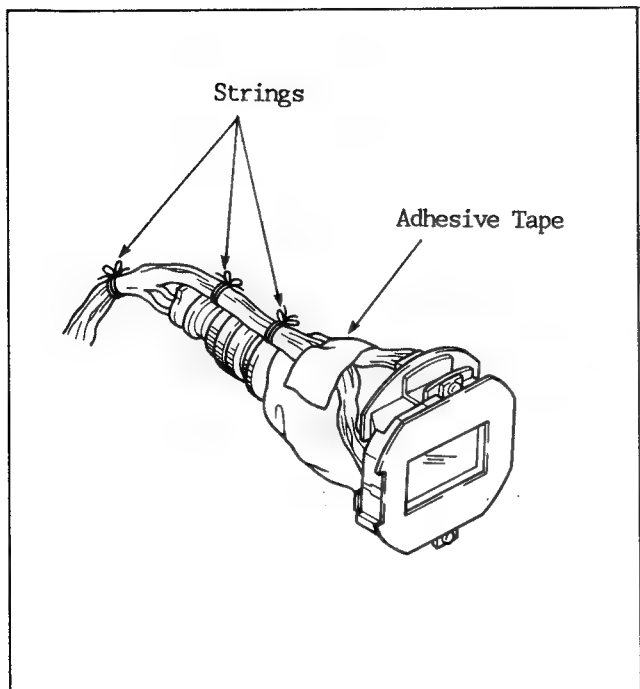
1. Remove seven screws shown in Figure. Remove the bottom case and VF slide guide. Extract the SW board and MAIN board from a top case.



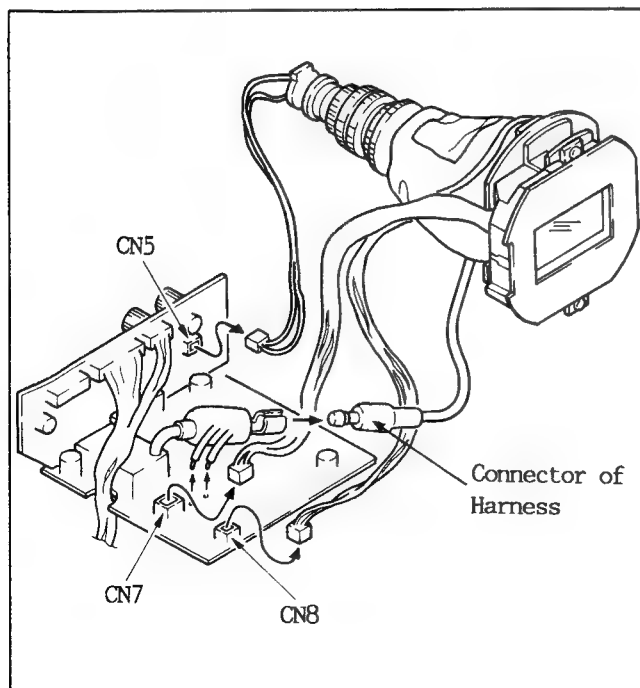
2. Remove the slide ring shown in Figure. Remove a screw and remove the CRT/DY ASSY from outside holders B and T.



3. Untie three strings and remove an adhesive tape.

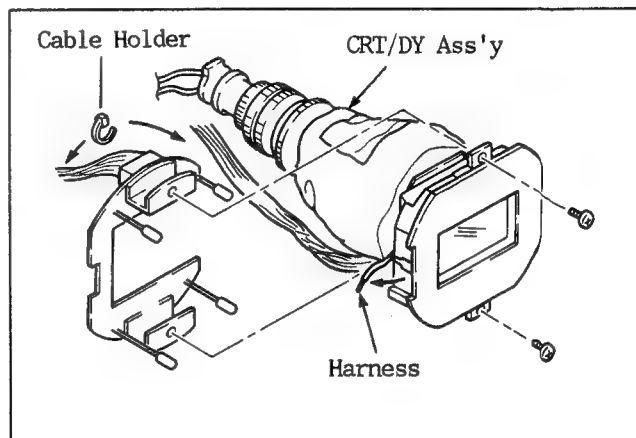


4. Disconnect a connector CN5 on the SW board and disconnect two connectors CN7 and CN8 on the MAIN board. Unsolder two wires and disconnect the connector of harness as illustrated.



5. Unsolder the harness shown in Figure. Remove two screws and remove the LED board from the CRT/DY ASSY.

Note: When removing the LED board, be careful not to damage four LEDs (light-emitting diodes) on the LED board.



6. When installing a new CRT/DY ASSY, reverse the procedures above.

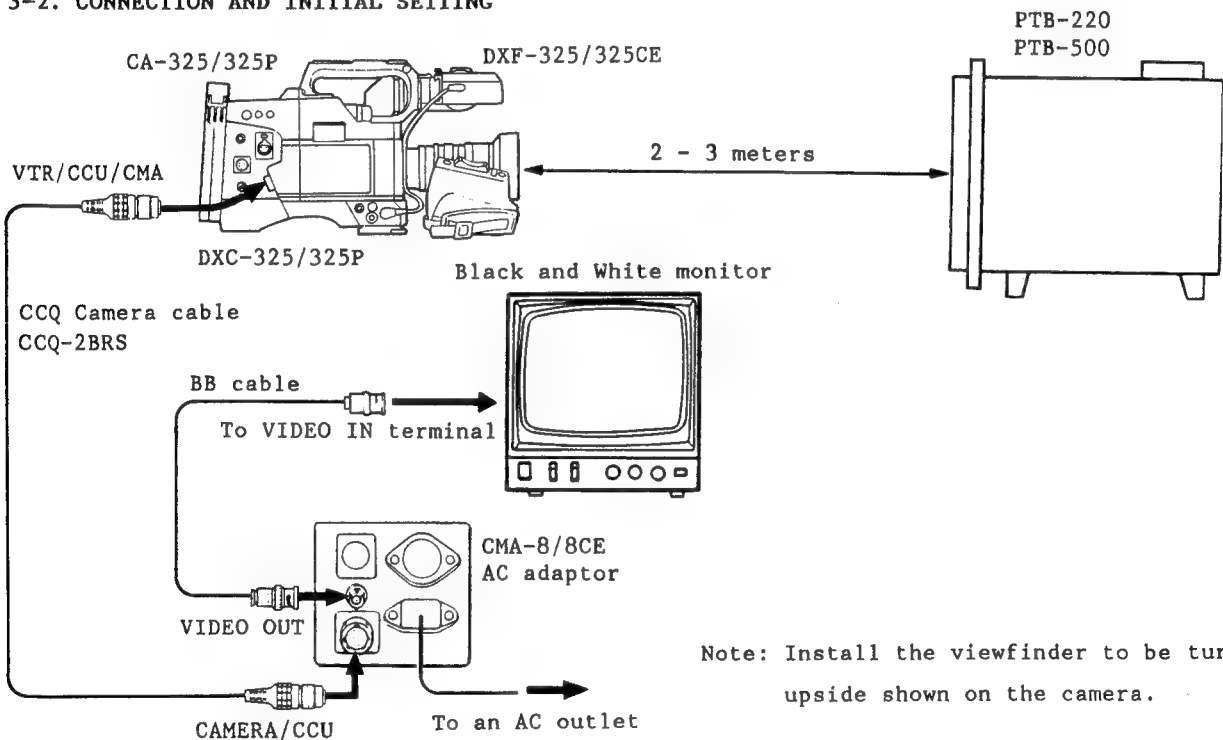
SECTION 3 ALIGNMENT

3-1. PREPARATION

3-1-1. Equipment Required

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Pattern Box PTB-220/500
Sony part number J-6020-680-A
or Pattern Box PTB-500 Sony part number J-6029-140-A 2. Resolution chart: Sony part number J-6021-870-A 3. Video Camera DXC-325/325P | <ol style="list-style-type: none"> 4. Camera Adaptor CA-325/325P 5. AC Adapter CMA-8/8CE 6. Camera Cable CCQ-2BRS 7. Black and White monitor PVM-91/91CE or equivalent 8. Oscilloscope 9. Waveform Monitor |
|---|--|

3-2. CONNECTION AND INITIAL SETTING



Note: Install the viewfinder to be turned upside shown on the camera.

3-2-1. Initial Setting

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Set the camera switches and controls as follows.
DXC-325/325P Video camera
BARS/WB selector: AUTO
GAIN selector: odB
DXF-325/325CE Viewfinder
CONTR control: Fully clockwise
BRIGHT control: Center
Lens
Iris selector: AUTO | <ol style="list-style-type: none"> 2. Preparation for picture <ol style="list-style-type: none"> (1) Adjust the zoom control so that the resolution chart frame touches the underscanned picture frame on the monitor. (2) Adjust the iris control for the best resolution of the monitor. |
|---|--|

3-3. VF SYSTEM ADJUSTMENT

3-3-1. Vertical Hold Adjustment

Equipment: Oscilloscope

Preparation: 1. Pull the ES-1 board out of the camera.

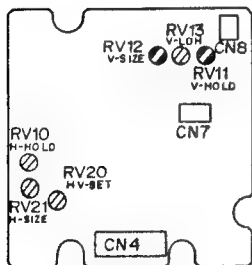
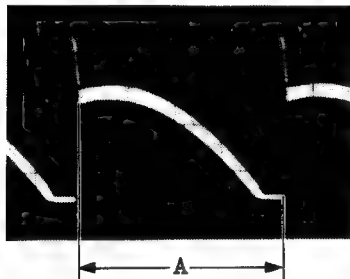
2. Set \odot RV12(V SIZE)/MAIN board to the mechanical center unless it is marked.

Test point: CN8-1pin/MAIN board

Adj.point: \odot RV11(V HOLD)/MAIN board

Specification: $A = 20.6 \pm 0.3\text{ms}$

Note: After this adjustment is completed, insert the ES-1 board into the camera.



MAIN BOARD (COMPONENT SIDE)

3-3-2. Horizontal Hold Adjustment

Object: White window chart

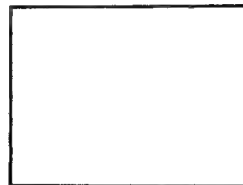
Equipment: Oscilloscope, Waveform monitor

Trigger: CH2/Oscilloscope

Preparation:

1. Adjust the zoom control so that the white window frame touches the underscanned picture frame on the monitor screen.

Monitor Screen



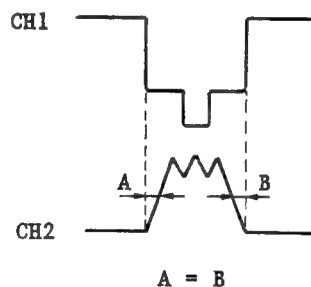
2. Adjust the iris control so that the white level at VBS OUT terminal is $700 \pm 10\text{mV}$.

Test point: CH1 CN5-1pin

CH2 CN4-3pin

Adj.point: \odot RV10(H HOLD)/MAIN board

Adjustment:



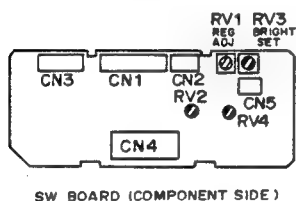
3-3-3. Bright Calibration Adjustment

Object: Resolution pattern

Preparation: Turn \odot RV4/SW board(BRIGHTNESS)→
fully counterclockwise.

Turn \odot RV2/SW board(CONTRAST)→
fully clockwise.

Adjustment: Adjust the picture by turning
 \odot RV3/SW board counterclockwise
from the rightmost position so
that the black and white gradation
scale is black up to the third
step and the fourth step is
recognizable.



3-3-4. Focus Adjustment

Note:

Step 3-3-5. Picture Frame Adjustment and this
adjustment affect each other.

Repeat these adjustments until both specifi-
cations are satisfied.

Object: Resolution chart

Equipment: Waveform monitor

Preparation: 1. Iris selector(Lens) "MANU"

2. BRIGHT control(Viewfinder)

→ mechanical center

3. CONTRAST control(Viewfinder)

→ fully clockwise(○)

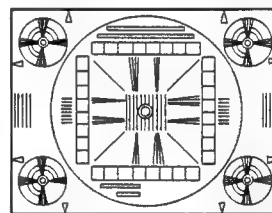
4. PEAKING switch(Viewfinder)

→ "OFF"

Adjustment:

1. Adjust the zoom control so that the
resolution chart touches the underscanned
picture frame on the monitor.

Monitor Screen



2. Adjust iris control so that the peak level
at TEST OUT terminal is $700 \pm 10\text{mV}$.
3. Adjust \odot RV20(FOCUS)/MAIN board so that
the picture on the viewfinder is best
focused.

3-3-5. Picture Frame Adjustment

Note:

Step 3-3-4. Focus Adjustment and this adjustment affect each other. Repeat these adjustments until both specifications are satisfied.

Object: Resolution chart

Equipment: Waveform monitor

Preparation: 1. BRIGHT control(Viewfinder)

→ mechanical center

2. CONTRAST control(Viewfinder)

→ mechanical center

3. PEAKING switch(Viewfinder)

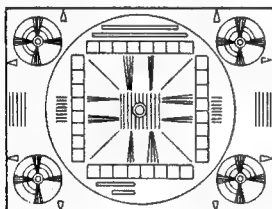
→ "OFF"

4. Remove the eye cap from the viewfinder.

Adjustment:

1. Adjust the zoom control so that the resolution chart frame touches the underscanned picture frame on the monitor screen. Adjust the iris control so that the white level at TEST OUT terminal is $700 \pm 10\text{mV}$.

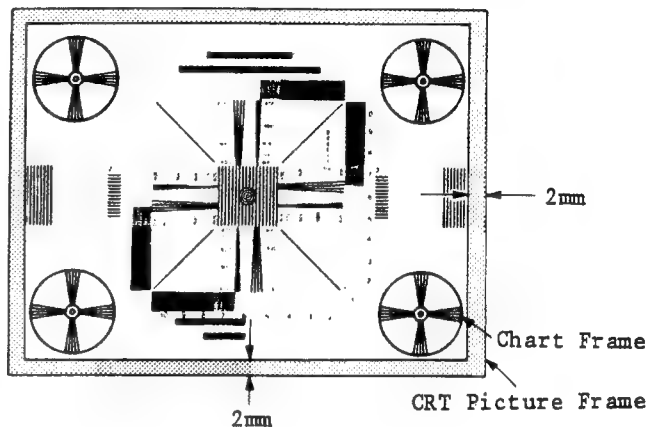
Monitor Screen



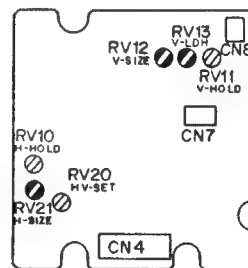
2. Adjust RV21(H SIZE)/MAIN board so that the H size of resolution chart is underscanned by approx. 2mm from the CRT picture frame.

3. Adjust RV12(V SIZE)/MAIN board so that the V size of resolution chart is underscanned by approx. 2mm from the CRT picture frame.

Viewfinder Screen



4. Adjust RV13(V LIN)/MAIN board so that the distortion of each circle at the four corners of resolution chart is minimized.
5. Repeat item 2 to item 4 until the specifications are satisfied.



MAIN BOARD (COMPONENT SIDE)

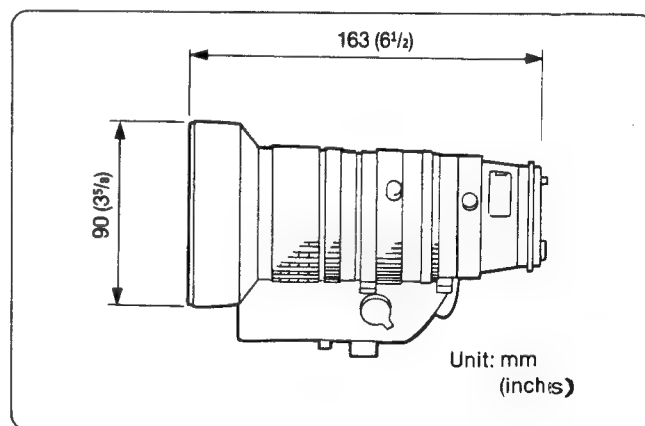
ZOOM LENS



SPECIFICATIONS

Focal length	8 to 80 mm
Zoom	Manual and motorized, selectable Zooming ratio: 10 ×
Maximum aperture ratio	1.4
Iris control	Manual and auto, selectable 1.4 to 16 and C (closed)
Range of object field (at the distance of 1.1 m)	W (wide angle): 622 × 829 (24½ × 32¾ inches) T (telephoto): 65 × 87 mm (2⅝ × 3½ inches)
Minimum object distance	1.1 m
Filter thread	62 mm dia., 0.75 pitch
Mount	Bayonet mount
Weight	Approx. 920g (2 lb) with lens hood
Supplied accessory	Operating instructions (1)

Dimensions



Design and specifications are subject to change without notice.

SONY®

SERVICE MANUAL

TABLE OF CONTENTS

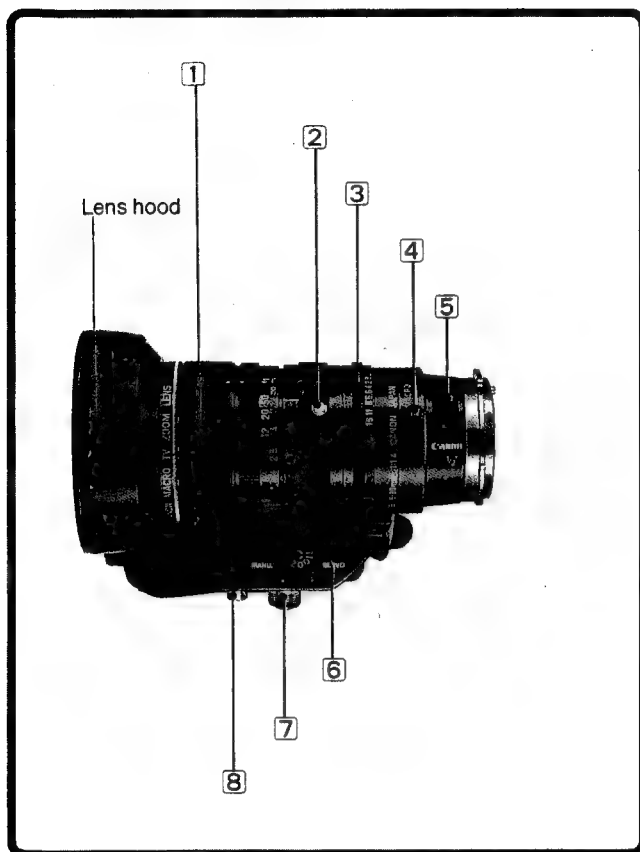
1. GENERAL DESCRIPTION

1-1. Location and Function of Parts and Controls	1-1
1-2. How to Attach the Lens to the Camera ..	1-3
1-3. Flange Focal Length Adjustment	1-4
1-4. Iris Adjustment	1-5
1-5. Zooming	1-6
1-6. Close —UPS— Shooting Small or nearby Object	1-7

SECTION 1

GENERAL DESCRIPTION

1-1. LOCATION AND FUNCTION OF PARTS AND CONTROLS



1 Focus ring

Turn this ring for focusing.

2 Manual zoom lever

For manual zooming, turn this lever with the ZOOM selector **6** set to the MANU position.

3 Iris ring

For manual iris adjustment, turn this ring with the IRIS adjustment selector **10** set to the M position.

4 MACRO ring and lever

To use the close-up function, pull out the lever and turn the ring toward the arrow direction.

5 Ff (flange focal length) adjustment lock screw cover

For Ff adjustment, take this cover off.

6 ZOOM selector

SERVO: For motorized zooming.

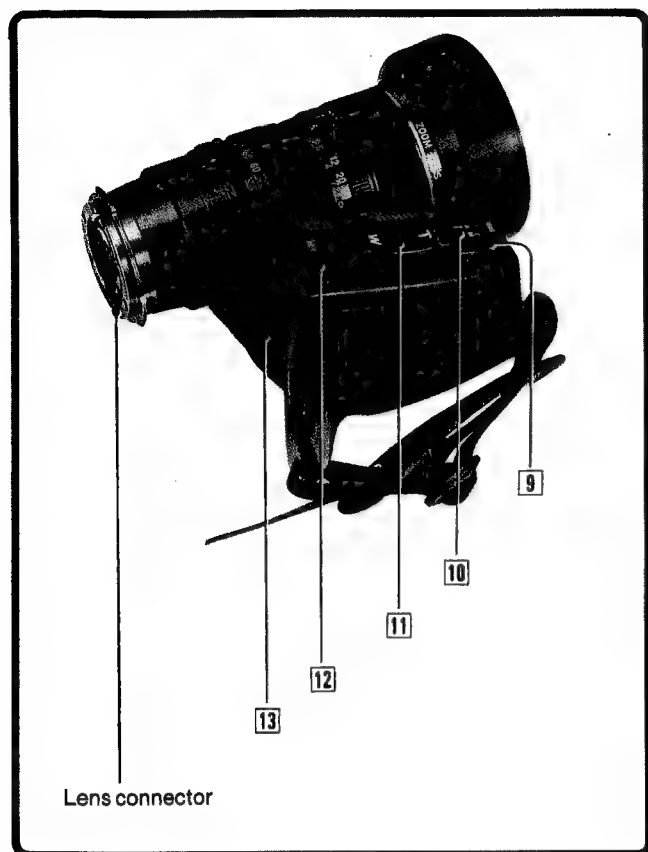
MANU (manual): For manual zooming.

7 Zoom remote control connector (8-pin)

Connect an LO-27 lens remote control unit (optional) for remote control of zooming.

8 Focus remote control connector (6-pin)

Not used.



9 Momentary automatic iris adjustment button

The iris is automatically adjusted while this button is kept depressed when the IRIS adjustment selector **10** is set to M. When the button is released, the iris will be fixed at the value that has just been obtained by the automatic adjustment until the iris is adjusted again manually.

10 IRIS adjustment selector

A (automatic): For automatic iris adjustment.

M (manual): For manual iris adjustment.

11 Motorized zoom switch

Press either end of this switch for motorized zooming with the ZOOM selector set to SERVO:W for a wide-angle picture and T for a telephoto picture. Zooming is fast when the switch is pressed down all the way and becomes slower when the switch is pressed down slightly.

12 RET (return video) button

Press to view the return video or the playback picture from the VTR on the viewfinder screen. (For details, refer to the instruction manual supplied with the camera.)

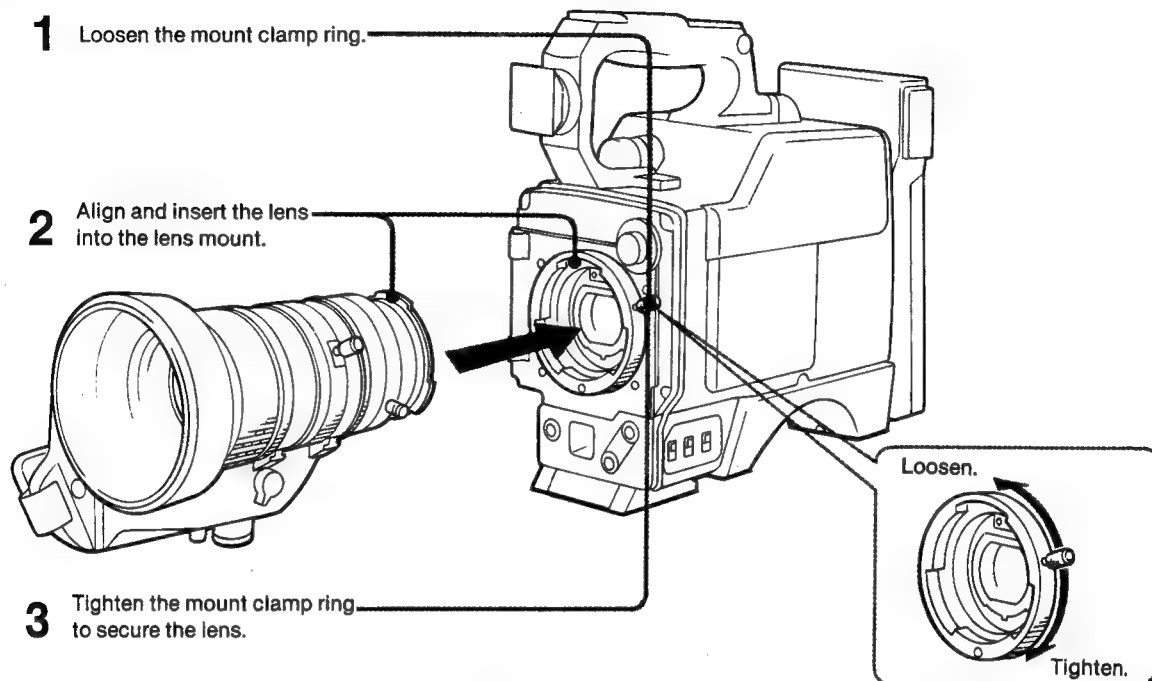
13 VTR button

When a portable VTR is connected to the camera, press this button to start and stop recording.

1-2. HOW TO ATTACH THE LENS TO THE CAMERA

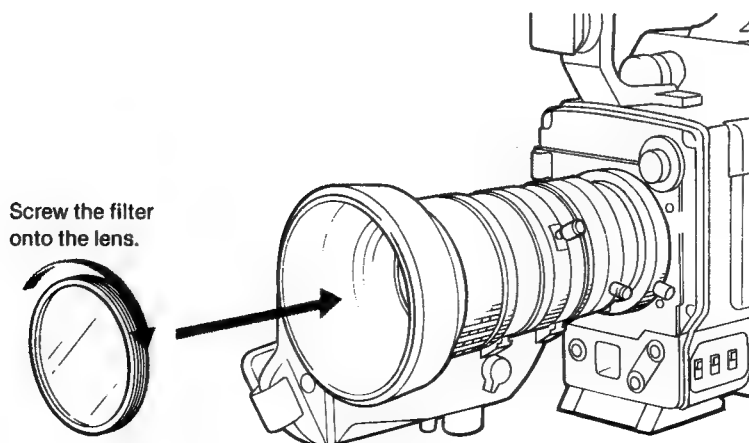
Note

If the protective cap is placed over the mount of the lens, remove it before attaching the lens.



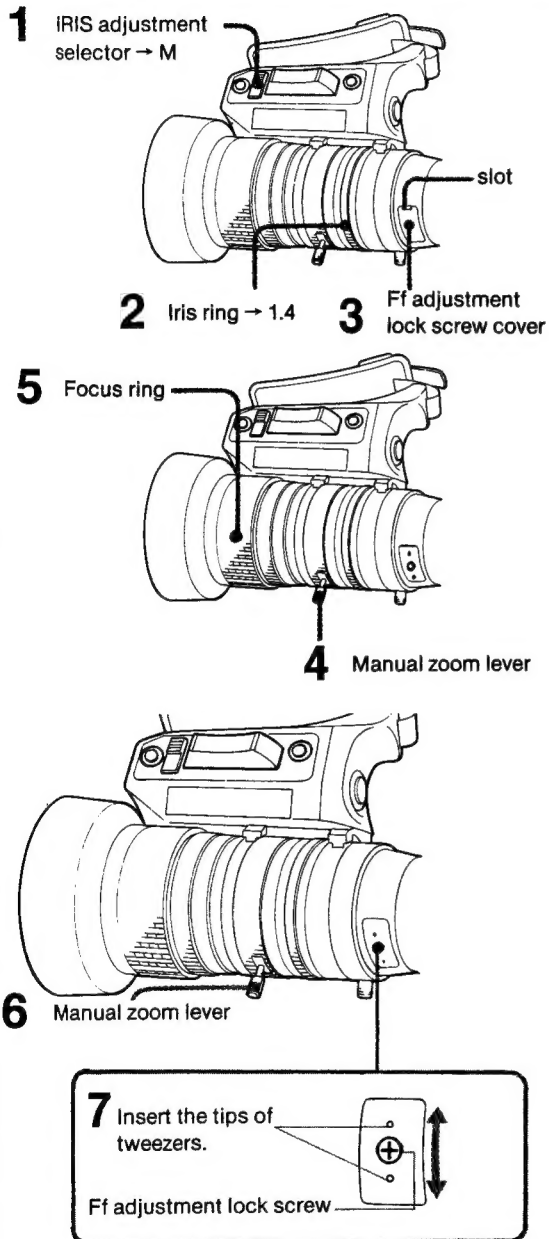
How to attach a filter to the lens

A filter can be attached to the lens unit without detaching the lens hood.



1-3. FLANGE FOCAL LENGTH ADJUSTMENT

The proper flange focal length adjustment insures that the object is in focus both at the wide-angle position and at the telephoto position when zooming.



1 Set the IRIS adjustment selector to M.

2 Set the Iris ring to "1.4".
Position an appropriate object and illuminate it so that the proper video level is obtained when the iris ring is set to "1.4".

3 Place the tip of a screwdriver in the slot and remove the Ff adjustment lock screw cover.

4 Set the ZOOM selector to MANU and turn the manual zoom lever to the "80" telephoto position.

5 Turn the focus ring until an object at about three meters (10 feet) from the lens is in focus. An object with fine detail is desirable.

6 Turn the manual zoom lever to the "8" wide-angle position.

7 Loosen the Ff adjustment lock screw and turn the Ff ring with a pair of tweezers (put the tips in the slots) until the object at three meters (10 feet) from the lens is in focus.

8 Repeat steps 4 through 7 until the object is in focus both at the telephoto position and at the wide-angle position.

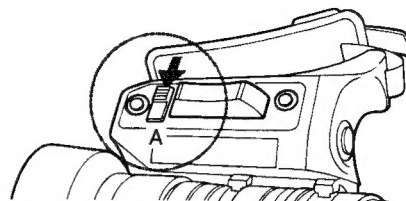
9 Tighten the Ff adjustment lock screw firmly, and then attach the Ff adjustment lock screw cover.

Once the flange focal length adjustment has been made, readjustment is not necessary as long as the lens stays mounted on the same camera.

1-4. IRIS ADJUSTMENT

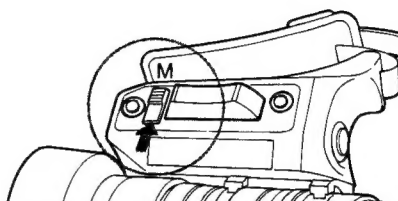
Automatic adjustment

Set the IRIS adjustment selector to A, and the iris will be automatically adjusted to the brightness of the object. Normally use the A position.



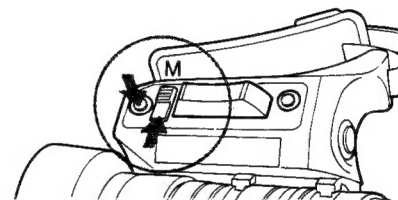
Manual adjustment

Set the IRIS adjustment selector to M, and turn the iris ring. Manual adjustment may be effective when recording an object against a bright sky or a scene with high contrast.



Temporary automatic adjustment

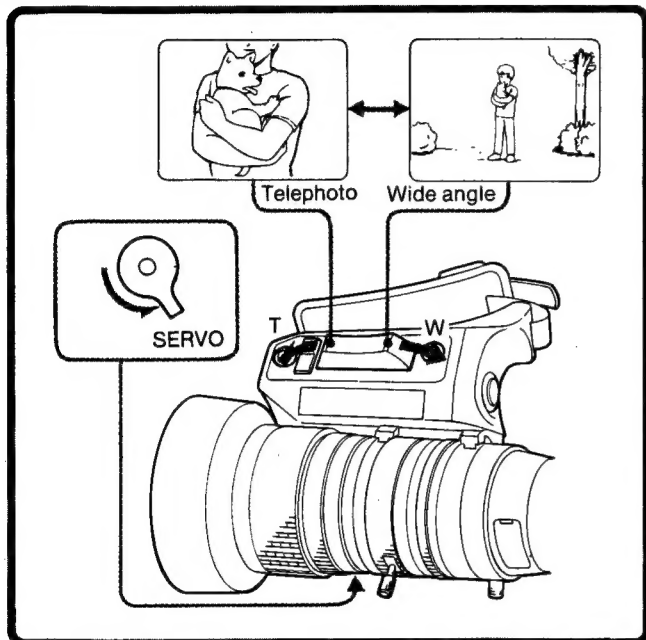
While the momentary automatic iris adjustment button is kept depressed during manual iris adjustment, the iris is automatically adjusted. When the button is released, the iris will be fixed at the value that has just been obtained by the automatic adjustment until the iris is adjusted again manually with the iris ring.



1-5. ZOOMING

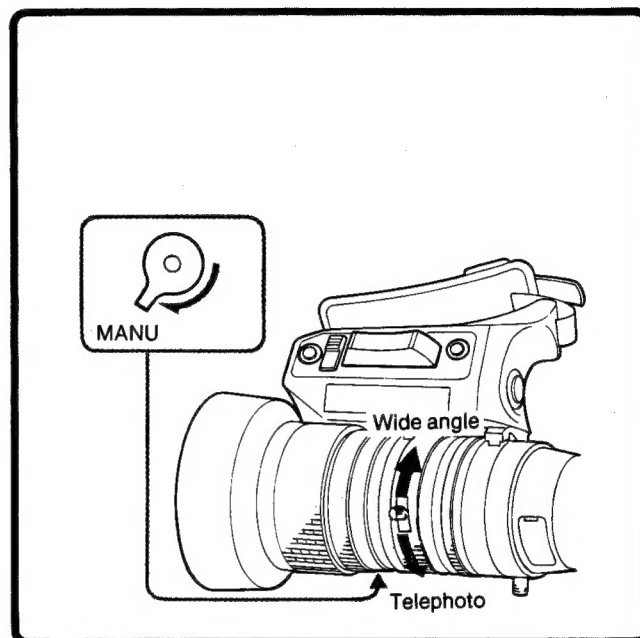
Motorized Zooming

You can zoom smoothly by pressing either end of the motorized zoom switch when the ZOOM selector is set to SERVO. Zooming is fast when the motorized zoom switch is pressed down all the way and becomes slower when the switch is pressed slightly.



Manual Zooming

Manual zooming allows more precise control of the zooming speed. You can zoom manually by manipulating the manual zoom lever with the ZOOM selector set to MANU.



Tips on Zooming

Zoom in

From wide angle to telephoto. Used to bring a distant object up close.

Correct focusing

If the subject is in focus in the telephoto position, it will remain in focus when you zoom back to wide angle.

Zoom out

From telephoto to wide angle. Used to move back from an object and gradually reveal the object's surroundings.

For a more stable picture

We recommend placing the camera on a tripod when zooming. If you zoom with the camera on your shoulder, stand as steady as possible.

Following

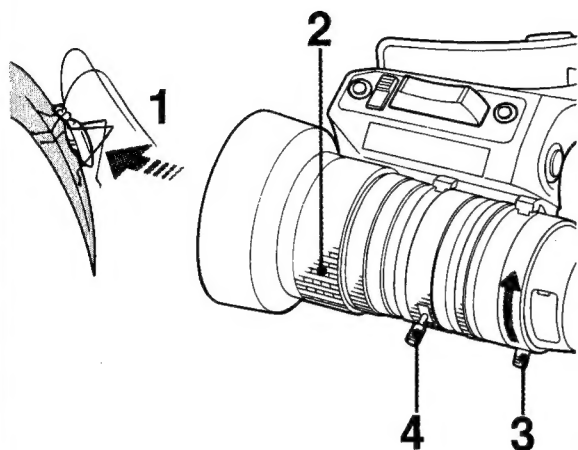
Zoom up on the subject and follow its movement with the camera. This zoom effect is used, for example, to emphasize the speed of the subject by making the background rush past in a blur.

Positioning the object at the center of the screen

For zoom in operation, adjust the focus in the telephoto position, and set to the wide angle position. Then start zoom in operation. Otherwise the subject may be out of the screen during zooming in.

1-6. CLOSE-UPS — SMOOTHING SMALL OR NEARBY OBJECT

The close-up or macro function lets you zoom in flowers, insects and even photographs. The minimum distance from the lens to the object is 10 mm in the "8" wide-angle zoom position.



1 Adjust the distance between the lens and the object to get the desired image size.

2 Set the focus ring to the " ∞ " setting.

3 Pull the lever and turn the MACRO ring in the direction of the arrow until it stops.

4 Focus by turning the manual zoom lever with the ZOOM selector set to "MANU".

When the close-ups operation is completed, return the MACRO ring to its click position.

Note

- If you wish to reduce the object's size on the screen, first adjust the focus following Steps 1 through 4 on the left page, then turn the MACRO ring slightly toward its original position and adjust the focus with the manual zoom lever again.
- If the focus ring is set to " ∞ " while the MACRO ring is turned in the direction of the arrow until it stops, the focus can be continually adjusted from the close-ups position to " ∞ " with the manual zoom lever.